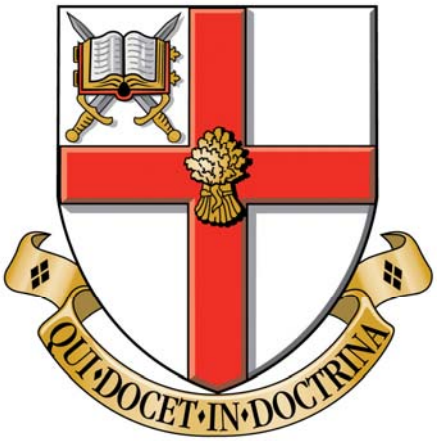

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Introducing the use of computers into a GCSE Art Textiles course: a case study.

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ABSTRACT

This study sets out to investigate the potential benefits of the computer as a tool in a GCSE Art Textile course and to provide recommendations for its use.

After briefly reviewing the historical and educational context of the tension between art and technology, the relevance of computers as a tool in the teaching of Art and Design, most particularly Art Textiles, is researched.

Through a case study, reasons are given for the introduction of the use of computers into a GCSE Art Textile course in one secondary school. The work gives details of how the study was carried out, what problems were met and how the pupils of the pilot benefited.

DECLARATION

The Work is original and has not been submitted previously in support of any degree qualification or course.

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ABBREVIATIONS

AT	Attainment Target
ATEX1	Art Textiles Pilot Group One
ATEX2	Art Textiles Pilot Group Two
CAD	Computer Aided Design
CAM	Computer Aided Manufacture
CD-ROM	Compact Disc Read Only Memory
CDT	Craft, Design and Technology
GCSE	General Certificate of Secondary Education
HMSO	Her Majesty's Stationary Office
I.T.	Information Technology
M.B.	Megabyte
P.C.	Personal Computer
PCX	Paintbrush File
RAM	Random Access Memory
SCAA	School Curriculum & Assessment Authority

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CHAPTER 1

INTRODUCTION AND BACKGROUND.

1.1 AIM:

To investigate the potential benefits and produce guide lines for introducing the use of computers at GCSE level, as a textile design tool.

1.2 OBJECTIVES:

To consider the requirements of the National Curriculum orders for Art.

To investigate the hardware and peripherals which might appropriately be used.

To investigate the suitability of some different software packages for use in textile design.

To test these with a group of pupils doing GCSE Art Textiles.

To review the pilot work with local textile design teachers.

To make enquiries into the use of computers in textile design at Higher Education level and in industry and try to discover whether they consider that pupils should be

given the opportunity of working with CAD.

1.3 RATIONAL:

Since the introduction of the National Curriculum, schools have had to give serious thought to how they might comply with the requirements for teaching Information Technology. Previously I.T. had been taught as a specific subject. Pressure on the curriculum was making this increasingly difficult and in any case there seemed to be a strong argument that I.T. could be taught more effectively as a cross curricular experience. Indeed, this is implicit in the "Technology" order which seeks to bring together previously autonomous departments such as CDT, Home Economics, Business Studies and I.T. Art, too, is involved, but also has its own order and, since 1993, Science is similarly connected to Technology. I.T. has its place in other subject orders too, such as those of English and Geography. As HMI (1985) had said:

> "Information Technology, which is having a profound effect on pupils whose adult lives will be in the 21st Century, should find a place in all subjects which are able to take advantage of the facility to store and process information and to generate further information."

In 1990, the head teacher of South Wirral High School made the decision that, for year eight pupils (aged 12), I.T. would be incorporated in the schemes of work of all subjects. At this time the Art department had no

computers and, of the then four members of staff, I was the only one with any experience of computers. My experience amounted to word processing and using simple spread sheets and data bases which I had learned to use in order to facilitate my work as Head of Sixth Form. The machine I used was a BBC "B" which was perfectly adequate for most of my requirements, that is, until I tried to draw rectangles round information for a prospectus. To my surprise, when I sought help with this from the Computer Studies Department, they recommended that I used a combination of word processing, "cut and paste" and photo-copying!

I tried to find some way in which the Art department could comply with the school's I.T. plan for year eight. It became obvious that the BBC "B" was not the machine for the Art department after we tried using the recommended graphics package "Image". It was very slow and quite limited. Although I felt that it was important to see a move away from the dominance of the use of computers for word processing and data handling, I was unhappy with the software package "Clip-art" advocated by the department of Craft Design and Technology. This has its uses but the danger seemed to me that children would become too dependant on other people's images, and the ability to produce slick but second hand illustrations.

More recently, as pupils were being prepared for Key Stage Three testing, some departments were given

specific responsibilities for covering the Technology, AT5 requirements. Art has not been included, and yet, aspects of I.T. are included in the subject's orders. The Art National Curriculum document (HMSO 1992) is at pains, in D12, to clarify the subject's links with Technology AT5, the I.T. capability. Again, in D15, there is a table to illustrate how the five strands of I.T. capability are relevant to art. The points most pertinent to Art Textiles and this study, are as follows:

Communicating information-
Develop, organise, store ideas in visual form
Extend range of available media and techniques
Experiment with colour mixing and geometric constructions

Handling information
Search, view and cross-reference works of art

Modelling
"Walk through" an interior design

Measurement and control
Transfer a design from one medium to another

Applications and effects
Reflect on how the use of IT has influenced the development of an image or design

Soon after the decision to make I.T. teaching for year eight a requirement on all departments, I became responsible for teaching the Art Textiles GCSE course. By now, my small experience with computer "Paint" programmes was leading me to believe that some aspects of

textile design could be considerably enhanced by the use of computers. I was interested by the possibilities and so decided to investigate.

In order that I could begin introducing the use of I.T. with year eight I had already acquired an RM NIMBUS 286 and a printer. As this was only capable of printing in black and white which was inadequate for the reproduction of coloured designs, it was obvious that it would be necessary to investigate different peripherals. It would also be necessary to investigate the software installed to see if this was appropriate for textile design. It might be possible to find software specifically designed for textile design.

Obviously, I would experiment with the capabilities of the hardware and software, myself, but I knew that this would not be sufficient. It would be necessary to discover how the pupils themselves reacted to this new tool. I knew already that many pupils in year eight were enthusiastic about using a computer in Art but would an older group, predominantly girls, be equally interested? It seemed essential that I run a pilot with a group of pupils doing GCSE Art Textiles.

Because of my enthusiasm for the project, I might fail to appreciate its short comings. It seemed likely that reviewing the work of the pilot study with some other textile design teachers would be beneficial. I was sure

that they would have suggestions to make and, hopefully, they would find that my pilot gave them some pointers as to how they might come to terms with I.T. and the teaching of Art. At this stage, among Art teachers I knew, there was considerable antipathy to the idea of I.T. in Art and, in particular, there was a fear of Art becoming emasculated by the Technology orders.

One way of discovering whether computers had a legitimate part to play in textile design would involve making enquiries into their use in textile design courses at Higher Education level. It would be useful to discover whether tutors, at this level, considered it helpful if their students had previous experience of designing with computers.

1.4 METHODS OF EVALUATION.

In the short term, one would hope that the pupils on the pilot courses would benefit from the experience of using computers. More specifically, one would also hope that they would find that the experience had been helpful to their GCSE Art Textiles. Similarly, if other teachers of Art Textiles also found the information helpful, then this would be pleasing.

Evaluation of how helpful the experiences had been for the two groups mentioned above would have to be formalised in some way. It might be possible to compare

GCSE results of groups that had not had access to the computer with those that had. However, there was only one previous textile group that I had taught that had not used the computer and the two pilot groups had access to different software packages. In addition, the textile groups in question were very small, generally about twelve in number, and the ability of the groups was very mixed.

Although I might gain the impression that reactions had been positive, this could be wishful thinking. Some feedback could be gained from the enthusiasm with which the pupils approached the computer, and the quality and quantity of the work produced. Perhaps more accurate feedback might be achieved through the completion of anonymous questionnaires. However, as Evans, A. (1992) says:

> "What matters is whether pupils are learning how to use computers constructively - and that means not simply knowing how to use a computer, but knowing when to do so."

1.5 BACKGROUND INFORMATION.

The need for all to become computer literate seems self-evident considering the importance of computers in the world today. Schools are constantly being urged to change; to improve the way they are run and to raise standards. The advice is endless and often conflicting. It is suggested by Cheever et al (1986) that schools will

indeed change but that this will be through the force of the technological revolution. As they say "Fuelling this technological whirlwind is the computer..."

The I.T. requirements of the National Curriculum give substance to the changes that some people had long felt were necessary for education. However, what was lacking, and often still is, was sufficient funding and even more importantly, sufficient knowledge. This was aggravated by a bias towards linking computers with certain subjects. The inhibitions that some pupils, particularly girls, experience regarding computers must be overcome if all pupils are to be adequately educated for the world we live in. As Straker (1989) says:

> "The computers in our schools need to be exploited to the full in order to give children an equivalent confidence and competence in using these as they have in using books."

That Art departments have any part to play in this might be questioned but as Bertram Russell famously pointed out, information in our modern world is largely visual. *This is reinforced in the* Cheshire Curriculum Policy Statement (1989)

> "The majority of the information we process is visual and we are an essentially visual culture. IT demands the development and organisation of ideas. The search for pattern and structure in managing complex or random information is inherent in Art and Design activity. IT requires functional and visual languages which are readily interpreted."

An even more explicit explanation of the importance of involving Art departments in the use of computers contained in the same Cheshire document is:

> "The expertise and judgement of the artist and designer is essential to the development and quality of visual imagery as presented by IT."

The quality of visual imagery produced on computers is enhanced by artistic understanding but, equally, there are processes in Art and Design which could be greatly enhanced by the use of computers. In textile design, for instance, the procedures required to produce a pattern, a series of repeating shapes; or a number of colour variations can be very slow and tedious. The traditional methods of producing a textile design would require many tracings of the initial motif. It is possible now, to create repeated images with the help of photo-copies but these still require trimming and pasting into position. The whole design could then be photo-copied again and coloured by hand. Alternatively, the design could be placed under paper, such as "layout" paper, which is thin enough for the shapes to be visible to the colourist. Again, each colour way would have to be carefully coloured by hand.

Although, these processes should be experienced and can be enjoyable, they do slow the design process. With computers, far more experimentation could be achieved in

the time. Computers also have the facility to re-size, stretch, rotate and flip motifs in a matter of moments. In addition, all stages of the development of a piece of work can be "saved", nothing need be lost, so that an earlier version of the design may be returned to if desired.

However, there are limitations and drawbacks to be considered and setting up computers as a facility in an Art department is not likely to happen over night. It takes time to weigh up the relative merits of different hardware and software available within a limited budget; it then takes time to experiment and become familiar with the capabilities which this new tool can offer. Finally, one has to discover how best the pupils may be given access to the benefits offered by computers to textile design.

That Art Textile Departments in Higher Education have already started moving into CAD is evident from national newspaper advertisements asking for applicants to lecturing posts for computer aided design. There is some evidence that the textile industry too, is using computers in design when the Textile Institute runs conferences called "Investing in Design by Computer"! In 1993, this will be held at the Business Design Centre in London. Speakers will represent the industry, the textile section of the Scottish Design Council,

designers from Britain and abroad, and Fashion and Textiles departments of Universities.

1.6 SUMMARY

The National Curriculum has reinforced the perception that computers have a place in the teaching of Art. There is some evidence that both Higher Education and the professional textile world make use of computers as a design tool. The study will seek to investigate this and try to suggest ways in which computers may beneficially be used by pupils in GCSE Art Textile courses.

CHAPTER 2

A REVIEW OF THE RATIONAL FOR THE TEACHING OF ART, INCLUDING NATIONAL CURRICULUM REQUIREMENTS.

2.1 A BRIEF HISTORY OF ART EDUCATION.

Art education has experienced many theoretical swings from the tightly proscriptive, subject-centred and skill oriented, to child-centred or "laissez-faire" self expression. That the debate continues today may be indicated by the style of the National Curriculum for Art which seems to be trying to bridge the divide.

Traditionally, the training for artists was based on specific skills and exercises were devised to inculcate these. This harked back to the medieval practice of being apprenticed to a craftsman working up from the most menial tasks, such as grinding colours for the "master" to work with, before eventually being trusted with painting.

The first school of art in this country was the Royal Academy, founded in 1768 by Sir Joshua Reynolds. He wished the school to emulate the classical training he had experienced in Italy. The purpose of the academy was

two fold; firstly to raise the status of artists above mere craftsmen, and secondly as a place of learning. This included how to create an illusion of pictorial realism usually with allusions to Greek or Roman myths; an emphasis which was largely pursued until the so called "Modernism" of the 20th century. Until recently, Academies of Art and their "classical" training became associated with all that is conventional and uninspired.

During this century, there has been a great diversification of styles of art, the majority of which have dispensed with the need for realism. Robert Hughes (1980) believes that the development of "Modernism" has come about because of the shift in western society, during the late 19th century, from the predominantly arable to the industrial and technological. One of the technological developments which had a profound effect on Art was the camera. Previously, and since the Renaissance, artists had been responsible for recording life realistically. Another 19th century development had involved colour theories such as tapestry director Chevreul's theory of "simultaneous contrast" in which he showed that the appearance of colours is affected by their neighbours.

The two most influential scientific theorists of the period were, however, Einstein and Freud. The former

challenged peoples' secure views of the foundation of matter while the latter had a profound effect on early twentieth century theories of the workings of the inner mind. As a result, again according to Hughes, artists developed "two main strands", that of defining the physical world as did the Pointillists, Symbolists and Dadaists, and that of the inner self, as did the Expressionists and Surrealists.

Rapid change is a characteristic of the 20th century and Parts (1992) concluded that:

> "Modern art both embraced and rebelled against the tremendous impact of science and technology on twentieth century life. Expressionists explored the new ideas from psychology; the Futurists heralded the dynamism of the Industrial Age; and the Cubists reflected new insights from physics in their work. While embracing the dynamism of the modern age, they were equally appalled by the devastating loss of human life and values wrought by science and technology."

Although many were excited by increasing industrialisation in the 19th century, it had a deleterious effect on the design and production of artefacts. To counteract this, the then Department of Science and Art set out a course based on drawing outlines of geometric solids to encourage hand control. Even infants in schools in 1890 were expected to learn hand and eye co-ordination by the freehand copying of straight and curved lines. According to Lansing (1992):

> "...immature children were not believed to have anything worthwhile to say, and if they did, they would not have the skill to express it. So it was necessary to show them what to do and how to do it."

Such a mechanistic approach to the teaching of drawing was not universally approved of and changes were slowly made. Ebenezer Cooke in England, Frank Cizek in Vienna, and Arthur Wesley Dow in America, were influential in changing the style of Art teaching. However, according to Read (1958) and as we have seen, not only were there opposing styles of education but the art world itself, had similarly conflicting ideas between "academicism, naturalism, impressionism and expressionism."

The complete change of attitude, away from the skills based, subject-centred, to what was sometimes known as a "laissez-faire" approach, was reached by the time of the Second World War. Two influential writers proposing a child- centred attitude to art teaching were, Lowenfeld (1964) and Viola (1942). This approach, however, lead to some bewilderment both of the children and their teachers. As Clement (1988) says:

> "Many teachers have found that an optimistic view of the initiative and creative powers of children does not of itself lead to salvation and ... will frequently result in disgruntled children producing unsatisfactory, muddled and messy work."

A direct reaction to this was the development of "Basic Design" courses which in turn were based on the teaching at the Bauhaus, the influential school of Art and Design in Germany in the 1920s. The Basic Design Courses adopted by many British colleges of Art and Design in the 1950s were aimed at reviving the theoretical basis for their courses. Inevitably, these ideas filtered into schools in the 1960s as art students became teachers. Too often, Art was now reduced to a series of sterile exercises taught without relationship to either the real world or the world of the imagination and self expression!

Two projects were set up in the 1970s. The first of these, "The Arts and the Adolescent" addressed the problem of the nature of the arts in school. In particular, Witkin (1976) looked at the difficulties with representation often faced by young people. This probably prepared the way for the Gulbenkian Report (Brinson 1982), the purpose of which was to re-emphasise, in the face of decreasing Government support, the vital importance of the arts in education.

The more practical, "Arts and the Built Environment" and the later, "Critical Studies in Art Education" projects, also gradually affected art education in the 1980s and early 1990s. The objective was now to involve pupils in situations that were real to them, by linking practical

work with careful observation of life around them and developing a critical awareness of works of art, craft and design from many times and cultures. The concern was to combine self- expression with practical, theoretical and critical areas in art education.

Much of this thinking of Art Educators of the 1980s appears to have influenced both the GCSE Art and Design Examinations and the National Curriculum. As we shall see, there is a place for the teaching of textile design and for the "appropriate use of technology"; for self expression and skills.

2.2 ART IN THE NATIONAL CURRICULUM

The National Curriculum Order for Art, (HMSO 1992) has stipulated that Art should be taught throughout Key Stages One, Two and Three. This gives a previously unknown support for the subject at Primary level, as there are definite Programmes of Study and End of Key Stage Statements. Although Art has usually been provided for in Primary Schools it has often been more of an adjunct to project work. Many Primary School teachers have no training in art, many giving up art themselves at the age of thirteen. Now, most are being offered extra training by their local authorities.

In Secondary Education, Art is largely taught by subject specialists and thanks to the National Curriculum, pupils of eleven should arrive having had more art experience than previously, but there is no requirement for Art to be continued at Key Stage Four. Having said that, unlike those of other subjects, the document for Art is not proscriptive, in spite of having Programmes of Study. There are Attainment Targets and end of Key Stage Statements but no end of Key Stage levels or tests.

The two Attainment targets in Art are: "Investigating and making" and "Knowledge and understanding". The general requirements for the programmes of study follow and I have highlighted these where they particularly seem to be offering an opportunity for including the use of computers in art.

"1. In all key stages, pupils should be given opportunities to:

* **undertake a balanced programme of art, craft and design activities** which clearly builds on previous work and takes account of previous achievement;
* work individually, in groups, and as a whole class;
* **make appropriate use of information technology;**
* work in two and three dimensions and on a variety of scales;
* evaluate their own and others' work.

2. **Pupils should understand and appreciate art in a variety of genres and styles** from a variety of cultures, Western and non-western.

3. **'Art' should be interpreted to mean 'art, craft and design' throughout and 'artists' should be interpreted to mean 'artists, craftworkers and designers'.**" (HMSO, 1992)

In addition, Attainment Target 5 of the Technology Orders (HMSO 1990), stipulates that:

"Pupils should be able to use information technology to:

* communicate and handle information;
* design, develop, explore and evaluate models of real or imaginary situations;"

This document goes on to stress the need for pupils to understand and make informed judgements about the importance and impact of computers in our everyday lives. To further support the place of I.T. in art, Table 16 in

the National Curriculum document for Art (HMSO 1992) illustrates how the five strands of I.T. have importance for Art. It is pointed out that there must be effective collaboration between departments to map out current practice, to decide where reinforcement of skills and knowledge would be beneficial, to decide on a policy for distinct assessment. The examples from Table 16 relevant to textiles are as follows:

Communicating Information	* Develop, organise, store ideas in visual form * Extend range of available media and techniques * Experiment with colour mixing and geometric constructions
Handling information	* Search, view & cross reference works of art
Modelling	* "Walk Through" an interior design
Measurement and control	* Transfer a design from one medium to another
Applications and effects	* Reflect on how the use of IT has influenced the development of an image or design.

It has been suggested by Evans (1991), that:

> "'communicating and handling information' includes nearly all creative media such as art and word-processing, desktop publishing and music technology."

Although, the requirement to study Art as a subject does not go beyond Key Stage 3, successive Secretaries of State for Education have reiterated, as in the letter that accompanied the National Curriculum order (1992), that they would hope that schools would continue to offer the Arts as courses up until the age of sixteen. Technology as a required subject at Key Stage 4 is under review.

2.3 REVIEW OF THE CURRENT USE OF COMPUTERS IN ART EDUCATION.

In spite of the antipathy of many artists to computer generated art, even Fine artists have been known to make use of computers. Faure Walker (1992), who first began using a computer in 1987 and who has been impressed by the freedom this gives him, says that he finds the computer, "luminous, malleable, and fast." Although he does not feel that the computer will replace painting he does not feel that it should be rejected by fine artists. Computers should surely then be available for use in art education.

As yet, in this country, there are few publications solely devoted to using computers in Art education but it is interesting that the main professional society for those working in Art and Design education at all levels, The National Society for Education in Art and Design,

commissioned an Art teacher, Chambers (1989), to write a book about his experience of introducing the use of computers into his department. In his introduction, he speaks of himself as "a six month computer expert." This seems to be the crux of the problem about computer use in Art education.

There has been little time for Art staff to develop new techniques during the last ten years. Teachers have been grappling with the changes brought about by TVEI, GCSE and by the introduction of the National Curriculum. Art educators, who in the main were not impressed by the slick and crude images which they saw generated by computers, had neither the inclination, the time, nor the equipment to experiment with this new tool. As a result there are still only relatively few enthusiasts.

Although Chambers says:

> "The tools are as yet not tactile. The ranges of movement gesture and attack are limited. Early experiences can feel like creating an image or design with hands encased in motorcycle gloves, with the action taking place inside a glass box."

Chambers also talks about the positive aspects and is of the opinion that the computer is capable of being used "to support a variety of teaching and learning styles." He explains where he has found the computer useful such

as in breaking down barriers for those less able at drawing while challenging the more able; as a focus for small group work; as a motivator; as a facilitator in enhancing the acquisition of basic design skills and more.

Hudson (1987), also advocates the use of the computer in art lessons. However, he warns that a computer can simply be used as an "automatic electronic colouring book" unless pupils are taught to work creatively and develop an aesthetic language to prevent their work from being superficial and banal. Of the computer he says:

> "It is a child of science, produced by technology, but its future will hopefully be in the hands of artists, philosophers, linguists and other creative people."

Chia and Duthie (1992), believe that there is a place for computer based art in all art schemes of work. They also write about the importance of making pupils aware of the aesthetic aspects of computer art. They feel that aspects of using computers such as "converting and combining imagery, chance, combining movement and sound, and audience interaction" will form the basis of aesthetic qualities. This is assisted by the facility of evaluating and modifying art work as it is being created. They conclude that children's "appreciation of the

qualities and effects of computer graphics will enable them to be more perceptive and critical consumers."

Geake and Porter (1992) show that giving pupils the opportunity to use a fractal computer graphics programme increased their perceptual sensitivity to the natural environment. The children's post experience paintings, when compared with those done previously, showed freer patterning and more exciting use of shape and colour.

In spite of the increasing support for the use of computers in the art room, the 1993 Design Council book shop "educational" list only offers one book on the subject of art and computing. This is "Computers in the Artroom" by Deborah Greh (1993). A spokesman for the Design Council Book shop said that most of their books on computer aided design are aimed at industry or Higher Education. It is still necessary to turn to articles in educational journals and newspapers to get up to date information on how computers might be used in the art room. This would seem inevitable in a relatively new aspect of education as there is always a long "lag" time in publishing.

As Primary schools all now have computers the Design Council's publication aimed at the primary sector, "The Big Paper", has included articles on I.T. One such is

that of Hughes (1988), suggesting that computers could be used to develop designs which may then be carried into different kinds of art, including simple textiles. More specifically, Straker (1989), describes how even very young children can use pixels to build up designs and control the size, shape, colours and symmetry. The design units can be repeated, investigated and suggest uses for things such as wallpaper or textiles such as patchwork, weaving, free embroidery and fabric printing. A further benefit, according to Straker, is the exploration through such work of "...mathematical ideas of reflection, rotation, enlargement and tessellation."

A Design Council termly newspaper aimed at secondary level, called "Designing" has also, from time to time, published helpful articles on computers. Hughes (1990), in "Chips with Everything" gave instances of how important computers have become in the design world and asked the question ..."what is their role in the classroom?". Her answer is that, since one of the main themes of the National Curriculum is the integration of information technology, provided that appropriate software is used, then computers have a role to play in design. She does point out that:

> "there is a trade-off in terms of the time taken to master both hardware and software but the investment is definitely worth it and the National Curriculum Council have endorsed this view."

Other articles have illustrated the use of computers as generators of images derived from self portraits which were then developed into sculpture or screen printing. Mathieson and Evans (1991) consider the potential to industry and schools of computer aided design and how they are responding to this revolutionary textile design tool. Although schools can seldom hope to provide the same level of equipment that is available to the design industry they say:

> "These days more and more of the objects around us are designed using a computer. In this context - and as a statutory part of the national curriculum - it is vital that students are given the chance to explore CAD technology and to understand how it can help design work."

Pipes (1990), emphasises the increasing ubiquity of CAD in industry and in higher education design courses. His article, also entitled "Chips with Everything", in another lively Design Council publication, called "D", was aimed at the Higher Education sector. Pipes, whilst recognising that the pencil is still a vital design tool, points out that computers can help in many other ways in addition to drawing and designing. They can be used to optimise materials and machine time, in alliance with desktop publishing packages they can produce attractive and informative presentations, and in textile design can

show the pattern or shape applied to a body before cutting the cloth.

Many equally positive articles can be found in American education journals such as Shapira (1991), "Design or Decline: America Facing the 21st Century". Here are stated the four main curriculum issues that concern the Design department of UCLA, the first of these being:

> "striking a proper balance between self-expression, problem solving, social value, skills development and computer aided design"

Warren(1989), points out that the computer is just another "creative instrument" in a long line such as the printing press, the Jacquard Loom and the camera which have all "proved their usefulness and attained acceptance. A longer article but with much the same message is that of Welter (1989) "Art and Computers: Is there Room in the Studio for Both?". Welter, like many Art teachers has reservations about the computer but he also points out the benefits they bring and says:

> "Using the computer as a tool to enhance art education points to a better teaching and learning environment, an ideal every educator should embrace".

An instance is given by Marschalek (1991), who discusses the advantages of using laser disk in the teaching of Art History.

Both the Times Educational Supplement and the Guardian's educational section publish articles and even whole supplements on computers from time to time. In the TES "Update Computers", Anderson (1991) writes about the enthusiastic use of Commodore Amigas in an Arts Faculty in a secondary school in Northumberland. This particular computer has been adopted for several reasons; it is cheaper than many others and yet it is versatile and reliable and well supported with compatible software. An additional advantage is the fact that many pupils already have this kind of computer at home although they may not have been aware of its full potential before.

There are other articles in the TES "Update" about the work done with computers in Art. Child (1991), describes how Chambers, one of the authors on art and computers mentioned earlier, was invited by the advisor for Strathclyde to become a "public/computer artist" for a month. During this residency, Chambers arranged for a group of teachers and students to combine the use of computers and video cameras to make electronic images of the Elgin Marbles in the British Museum. Having captured the images they were then able to manipulate them on the

computer relating these images of Ancient Greece to modern youth culture.

Another group project used similar techniques to help pupils see and manipulate images of their own built environment. Images of walls were "repainted" with well known paintings and a courtyard was transformed with an enlarged image of one of their own sculptures shaded by electronically "planted" trees. Thus, Chambers showed how computers helped particularly in the area of observation, research and development as "it helped pinpoint the issues powerfully and involved students creatively."

There is evidence of several other education authorities encouraging the use of computers in Art. In 1990, Cheshire Education Authority used ESG funding to sponsor a head of Art to spend two years investigating and then supporting schools in using computers in art. Also in 1990, the London Borough of Enfield provided the opportunity for a group of Lower Sixth Formers to spend a week on an Arts project where they used computer graphics as a major intermediary stage in the development of their work.

According to Child (1991), Cleveland County Council's "Educational Computing Centre" has produced a video and booklet called "Computers in the Art Room". This was the

result of two year's research involving six of their comprehensive schools and a sixth form college. In Child's opinion " a lot of what is shown in the Cleveland video ought to be self apparent". Presumably he feels that the information given in the videos is too basic but perhaps he is assuming too much about the provision of computers in art departments generally. When I asked, in December 1993, about the use of computers in Art departments in Wirral secondary schools, I found that few had sufficient access to computers, let alone the expertise to use them.

Chia and Duthie's article starts with a quote from Brand (1987),

> "Once the new technology rolls over you, if you're not part of the steamroller, you're part of the road."

In other words, it is pointless, even self-destructive, to ignore new materials and methods. One must move with the times if one is to survive.

2.3.1 The relevance of computers in textile education.

In support of the case for the usefulness of computers in textiles, there is considerable evidence that embroiderers, machine knitters, patchworkers and weavers are beginning to use computers and are seeking advice on

this. "Embroidery" regularly has articles on how computers may be used to generate designs for all manner of techniques. Charlton (1992), describes how the programme "Drawmouse" was used to generate many designs by combining Peruvian influences with her own drawings of cats. It was suggested that the information in this article might encourage readers to use technology to create entries for the "Computer and machine-aided design" category in the 1994 Members' exhibition!

Many who subscribe to this magazine are also members of the "Computer Textile Design Group" which publishes a quarterly newsletter full of advice and ideas. There are articles on software that members have found suitable for different textile techniques ranging from bobbin lace design to weaving. Information is given on textile projects which have been carried out with the help of the computer. An example of this is Jones (1993) who describes the development of intricate Blackwork designs using "MacDraw Pro". Grey (1993) explains how she made use of the stencil option on "D-Paint" on her IBM desktop to combine designs which were printed out using a colour transfer ribbon which could be ironed onto polyester fabric as designs for quilting, freehand embroidery and machine lace making. In addition, there is advice on peripherals which members have found useful.

There is another recently organised group "ETTA", (the Embroidery and Textile Teachers Association), which has held exhibitions and provided information, in a newsletter, about the use of computers in textile education, from primary to degree level. One such contributor was Doubtfire (1993) who describes her growing enthusiasm for as she says

> "Computer aided design has proved to be a valuable part of design education and potentially one of the most exciting tools a textile designer could have at their disposal!"

2.4 SUMMARY.

Even a brief review of the history of Art education reveals the continuing tensions between "Fine Art" and "craft"; between those who see themselves as exemplifying a higher level of imagination and expressionism as opposed to the pedestrianism of skill and technology. Eventually however, even the finest of artists come to accept the influence of new technologies. Where would we have been without the printing press or the camera in modern art education?

The introduction of the computer as a tool in Art and Design education at all levels has made a slow start although there is published evidence, mainly in newspaper articles and educational journals, which indicates that

those who have had the time and opportunity to experiment with the computer as a design tool have found it rewarding.

As yet there do not seem to be enough people with art training who also have sufficient computer expertise to persuade art teachers and lecturers generally that here is a tool worth looking at. However, the National Curriculum gives clear encouragement in both the Art and the Technology orders for the idea that Information Technology has its place in the teaching of Art and that Art and Design has a contribution to make to the teaching of I.T.

CHAPTER 3

A REVIEW OF COMPUTER USE IN ART DEPARTMENTS IN ONE LOCAL AUTHORITY.

3.1 THE USE OF COMPUTERS IN ART DEPARTMENTS IN WIRRAL SECONDARY SCHOOLS, PARTICULARLY FOR TEXTILES COURSES.

There are twenty secondary schools in the Wirral, the authority for which I work. Of these schools O and P are girls' grammar schools, schools A,C,G,H, and L are secondary modern and the remainder, B,D,E,F,I,J,K,M,N,Q,R,S,T, are comprehensive schools. All are mixed except B which is all boys and I which is all girls. R,S and T are catholic schools. A surprisingly diverse selection which has arisen from the amalgamation of parts of three education authorities with the formation of the Wirral.

All the schools were contacted, initially by telephone. As some art departments are a considerable distance from the school office and do not have their own extension, those heads of department with whom I couldn't talk directly were faxed a questionnaire (appendix 1).

Not all replied but I received information from fifteen, 75%, of the schools (see summary appendix 1).

I was not surprised to find that very few of this authority's art departments were making use of computers. The majority were ill equipped, with no more than one *stand alone computer, to provide any form of experience* of using computers in art. There was considerable variety in the computers available to the art departments. To some extent this mirrored the changing circumstances of groups of schools depending on when, or if they had received TVEI funding.

The Authority does not support Apple Macs. and so head teachers are reluctant to buy these because there would be no back-up repair service. The computers installed or available for the Art departments to use were as shown in Table 3.1 which follows. Where stand alone computers are shown, this indicates the sole computer available within departments.

A Graph to Show the Types of Computer Used in Wirral Schools Art Departments.

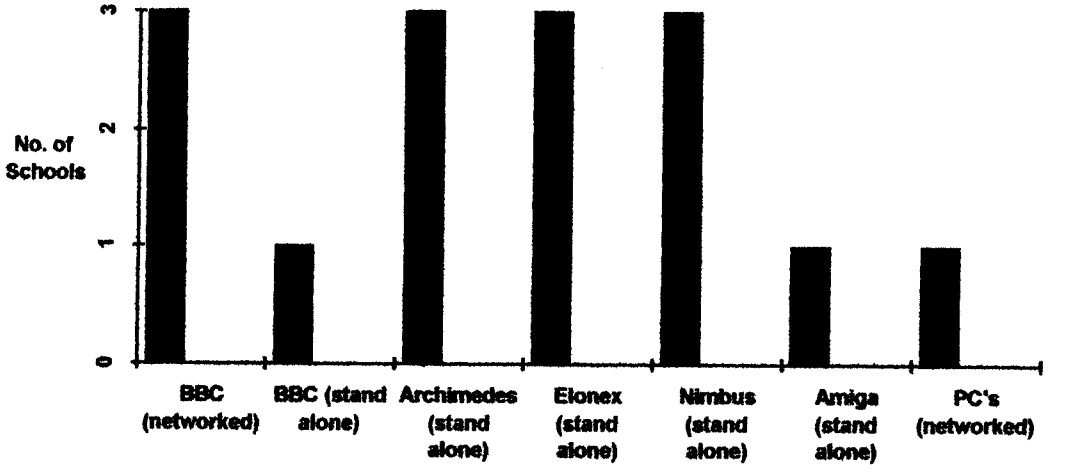


Table 3.1

BBC (networked) - schools C,E and R

BBC (stand alone) - school P

Archimedes (stand alone) - schools H, K and O

Elonex (stand alone) - schools B,C and Q

Nimbus (stand alone) - schools L,M and R

Amiga (stand alone) - school D

PCs (unknown make, networked) - school E

Only school E seemed to have developed, in conjunction with the I.T. department, opportunities for pupils in years 7 and 8 to work, as whole classes, on the networked BBC computers. They are now developing a further opportunity for pupils to work with computers. This will involve pupils in year 9 using PCs. This Art department does not have computers of its own but feels that it is necessary to make good this deficiency by working with

the expertise and equipment of the I.T. department. School E has thriving GCSE Art Textiles courses but does not, as yet, use computers here. In addition they had noticed a move, by the examination board, to encourage the use of computers in GCSE Art Drawing and Painting courses and were keen to follow this lead.

School R's art department had previously had links with the I.T. department and had been responsible for delivering part of AT5. The newly appointed head of department was not sure what this had entailed although he was interested in re-instating the use of computers in Art - when he had time.

Most of the Heads of Art contacted felt that they lacked training in the use of computers in art. The majority would welcome training, as would their departmental colleagues. Eight Wirral schools seem to teach some textiles in Art but only schools E,H,K,L, and O teach Art Textiles at GCSE level. The staff teaching Art textiles at GCSE level showed an interest in seeing the possible uses to which computers might be put in this area as so far they had not had an opportunity to do this.

3.2 DEMONSTRATION OF SOME OF THE WORK OF THE PILOT TO WIRRAL TEACHERS OF ART TEXTILES.

I was interested to discover whether the use of computers as a tool in the teaching of Art Textiles was considered by other Art teachers to have relevance. As has already been shown in Chapter 3, it was evident from my initial contact with the Art Departments in Wirral secondary schools, that few departments were adequately equipped with computers and few Art Departments used computers in the teaching of Art.

Although few Wirral Art Departments taught GCSE Art Textiles, the Teacher Advisor for Art was keen that the teachers should have the opportunity of seeing what I had been doing with a computer in the teaching of textiles. A date was set for a demonstration and the advisor contacted four schools.

Unfortunately, the schools were given muddled information and perhaps this explains why only two schools were represented at the evening demonstration. Maybe the evening chosen was inconvenient but another explanation might be that the other teachers were not interested. A recent day course arranged in Wrexham by the "National Society for the Teachers of Art and Design" on the use of computers in Art and open to all members in the North

West of England and North Wales, attracted four participants when there was equipment for at least twenty. Similarly arranged courses on Printmaking and Raku firing at the same venue on another occasion were both fully attended. This would seem to confirm the impression that there is considerable resistance to the use of computers as an Art tool.

Although I was concerned and disappointed by the numbers present, I was not surprised. To some extent only having two participants was an advantage as I had only managed to arrange for two Personal Computers to be set up with the appropriate software, namely "Deluxe Paint" and "Drawmouse" on each. To one computer was attached the Art department's Canon PJ1410 printer and to the other was my Hewlett Packard Deskjet 500C.

In addition to the hardware and software I had set up a display showing examples of work done by both my GCSE pilot groups using the two software packages. The examples of work produced using "Deluxe Paint" included several tile and cyclic designs and sheets showing how the "brush" tool could be used to develop both an abstract pattern and lettering. Another lettering example showed how it could be developed by outlining. These designs had made use of many of the different tools and a variety of colours.

The examples from "Drawmouse" concentrated on the aspects most useful in textile design such as the many repeat types available including "half-drop" and "unit-drop". There were also several examples using the "load over" facility and an example of a colour separation which could be photocopied and enlarged onto acetate for use as an opaque when developing a light sensitive screen for printing

There were two other aspects of the display. The first showed examples of art and art textile work that had been produced in other schools and illustrated in some of the publications of the Design Council. Finally, I had displayed scanned images produced with a small hand held scanner which I had recently bought. The scanner was a Logitech "ScanMan 32" and the scanned images were of printed, embroidered ethnic and tied and dyed fabric. Although this simple scanner only produces black and white images the examples showed how clear the images could be and how they might be useful in the further development of textile designs.

The teachers were able to look at the displays and discuss these with me. I then showed them the screen dumped instruction sheets I had made for working with "Deluxe Paint" (appendix 2) and the teachers were free to

experiment with this programme on the computers. There was not time in this evening meeting, unfortunately, for them to try "Drawmouse" or see the scanner working as the teacher advisor, who was also present, spoke about other matters for far longer than had been anticipated.

3.3 RESPONSES OF THE WIRRAL TEACHERS OF ART TEXTILES.

After the demonstration evening the teachers completed questionnaires and returned them to me. (appendix 3) Obviously, the sample is too small to have any statistical significance but the general tenor of the answers and the comments made verbally to me confirmed my impression that there was very little use being made of computers in their Art departments. This was mainly because the staff had little experience of using computers themselves and had received little encouragement or support to change this.

The teachers at the demonstration both said that this had given them a new insight into how computers could be used and that they had never before seen such work produced with the help of computers. Their departments were each equipped with a computer which few people used but both felt that they should begin to learn how to use the computers in their departments. Unfortunately, the computers available to them were both Archimedes so the

work that I had shown them was not directly applicable to their situation as the software that I was using was designed for PCs. I was able to suggest that there was a "tile" programme called "Techtile-Archimedes" produced by a company called "Clwyd Technics", which had been developed for use in textiles that might be worth considering. In addition there are paint programmes for the "Archimedes" such as "Pro Artisan" which could be used.

Although only one of the teachers thought that the computer might be a useful tool for pupils to draw and paint with both thought that it would be useful for experimenting with colour, textures, shapes, sizes, repeats, and for producing copies, colour separations and saving designs for future use.

Of the disadvantages, one felt that the feel of the mouse and the limited size of the design were important while the other thought that;

> "only having one computer would restrict the use to small groups of A' Level. I see computers as an aid to developing design and as a continuation of observational drawing not as a substitute and would like it to be used in a similar way that we use photo copies."

The main fear of the two teachers was that although they would like to learn how to use computers as a design tool they simply did not have sufficient time to struggle to do this themselves. One responded specifically that she would need "one to one ongoing evening sessions"; the other that she would need a "suitable programme for our computer and time to experiment so that I am familiar with at least some of the possibilities available."

3.4 SUMMARY

When we examine the use of computers in Art departments in the secondary schools in one local authority, the picture is rather dismal. Although the majority of the heads of Art departments showed a preparedness to consider computers as a potential tool of their art department, there were two main difficulties which would have to be overcome. The first was the need for training for art teachers and the second, the need for the provision of suitable equipment. What is at present available is woefully inadequate. Stand alone machines are mostly "played on" by a few interested pupils. Not surprisingly, the use of computers as a tool in the minority option of GCSE Art Textiles is almost non-existent.

The small number of responses from Art teachers in the Wirral makes a statistical analysis of their questionnaire impossible. One can only suggest that there is a perceived need by a few, for understanding and using I.T. in Art departments. There is also evidence of a need for much more support for the teachers in the form of time for training and in the provision of suitable hardware and software.

CHAPTER 4

A REVIEW OF THE PLACE OF COMPUTERS IN TEXTILE DESIGN AT HIGHER EDUCATION LEVEL AND IN INDUSTRY.

4.1 COMPUTERS IN HIGHER EDUCATION ART TEXTILES COURSES.

Although there does not seem to be much evidence for the use of computers in Art departments in Wirral secondary schools and still less connected with their Art GCSE Textiles courses I was interested to discover whether there was any use of computers in Higher Education Textile degree courses, as these train the designers and art teachers of the future.

I had seen the work of a young textile designer at the Design Centre in 1992 and discovered that the computer system that she had been using had been supplied by "Concept 11" in Stevenage. I arranged to visit "Concept 11" who supply many colleges and universities, as well as freelance designers, with computer packages including "Cameo Paint" and "ORMUS" textile design software. They provided me with printouts of designs using the two systems (see figs. 4.1 & 4.2) and also with a list of 56 colleges who had bought their "ORMUS" system which is largely superseding "Cameo Paint".

Designs developed using "Cameo paint"- provided by
Concept 11

Due to the constraints of time it was necessary to limit the number of departments I would ask about their use of computers in the training of their Art Textile students. I selected three; the first at Liverpool John Moore's University, as it is local to me; the second at Manchester Metropolitan University, another local, well known Art Textile department; and Central St Martins School of Textiles and Fashion which is part of the London Institute. This last is the largest provider of higher education in art and design and related studies in Europe.

Textile courses at higher education level are usually divided into the following specialist design areas: constructed and woven textiles, embroidery, fashion, knitted and printed textiles. All these specialisms will not necessarily be offered. Central St Martins College, School of Fashion and Textiles for instance, offers BA (Honours) courses in Fashion, Jewellery and Textiles; a Postgraduate Diploma and MA courses in Textile Design and an MA in Fashion. Their BA (Hons) Textile course includes the study of printed, woven and knitted textiles. They state in their prospectus that they, rather unusually, believe that it is important that their students explore each of the areas for at least a term before specialising. They also state their support for

transferable skills such as computer studies "...to complement design abilities." (csm, 1993)

The three lecturers I visited were convinced through their own experience, of the importance of computers in commercial textile design. Graham Worth, from Manchester Metropolitan University, had first experienced using computers in textile design in 1973, ten years before he took up his appointment at Manchester. Martin Dawber of Liverpool John Moore's, and Malcolm Cocks of Central St Martins each commented on the prevalence of the use of computers in textile design studios in New York.

It was when Cocks was in New York in the 1980s on a textile design project for a well known textile company, Warner's, that he first became aware of the importance of computers as a design tool. Cocks then completed an MA project at the Royal College of Art for which computer design played a crucial role. He is now the lecturer at the school of Textiles and Fashion at Central St Martins, responsible for computer aided design and manufacture. He is also a consultant for Crowson Furnishing Fabrics and for Laura Ashley whilst continuing to use computers in his own designing for textiles .

Designs developed using ORMUS system - provided by Concept 11

It was interesting to discover that, although the three higher education textile departments that I visited have all begun to use computers in textile design, each has a different emphasis. Between them however, they show that computers are being used in design for fashion, weave and embroidery, and printed textiles. The emphasis at each institution depends on the main interest and training of the member of staff involved with introducing the use of computers. In each of these institutions I found that the students who are engaged in a different field of textiles from that of the tutor who is introducing CAD, do not seem to get the same encouragement to use computers. This seems more from a lack of understanding or enthusiasm for CAD, of the lecturers in their chosen field, than from any discouragement from the lecturer responsible for introducing computer aided design in their institution.

The students now being trained in textile design at the three departments visited receive rather different experience of computer aided design depending on which institution they are in. Although all are given some opportunity to work with computers this can be as limited as basic word processing.

NAME..... MODULE.....

1	2	3
DRAWING	DRAWING	COLOUR PROPORTION
PENS/BRUSHES	SAVE	RELATIONSHIP OF COLOURS
FILL	DESIGN	
REPEATS	FILL/OVERLAY	
COLOURWAYS RANDOM/INDIVIDUAL COLOUR	LOAD	
COPY/MOVE	LOAD OVER	
TURN	SAVE PART	
MIRROR	BACKGROUND/ FORGROUND IMAGES	
TILT		
ROTATE		
ZOOM - REDUCE/ENLARGE		
EDIT		

fig. 4.3

4.1.1 Liverpool John Moore's University

The textile department offers the following areas of study: construction (weave and fibre art), fashion and print. All First year students are given training on computers in groups of six for ten weeks. Each group has half a day a week during which they learn how to use "Paint" programmes by first being given time to experiment and then by being set simple tasks to accomplish (see fig. 4.3). Mr Dawber feels that the Construction (weave and fibre art) students show the least enthusiasm for working on the computer.

In year two, Fashion students spend half a day a week in the first term making free fashion drawings of their own choice whilst familiarising themselves with using the A3 digitiser pad provided with the ORMUS software. (see fig. 4.4) This incorporates the commands, such as type of line, pattern, colour, or the level at which the drawing is taking place, in its pressure sensitive surface. The "ORMUS" course runs parallel with practical pattern cutting tuition. In the second term, having gained some understanding of the practicalities of pattern cutting, the students begin to use the "ORMUS" pattern cutting and grading system and continue to use this with increasing facility during their course.

Students at Liverpool John Moore's using the ORMUS system and digitiser pads.

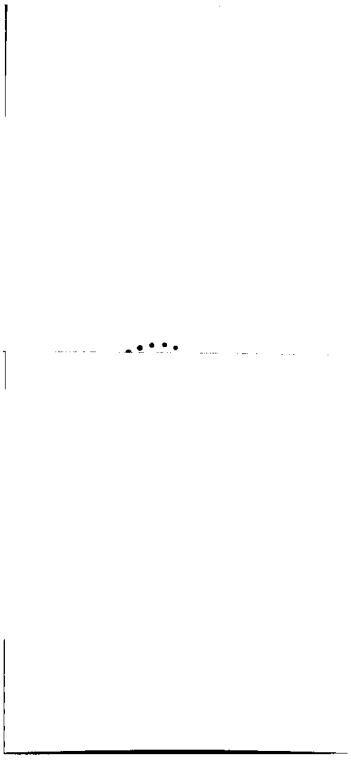
fig. 4.4

The pattern cutting and grading system used at Liverpool was also supplied to "Courtauld's Leisurewear" who design garments entirely for Marks and Spencer. I saw the system being used when I visited their design studio in London in 1993. The pattern cutter to whom I spoke had trained to use the system twelve months before and her attitude to it was very positive. She pointed out that even the appearance of the studio had altered as there was no longer any need for the rails of paper patterns in ranges of sizes which used to hang around the walls. Now these are generated and printed by computer in minutes, as required. The system stores information on patterns in outline. The pattern cutter can call these up and alter shapes, such as the length or width of a sleeve. The pattern can be scaled to fit different body sizes and then printed out. (see fig.4.5)

4.1.2 Manchester Metropolitan University.

The textile department at Manchester offers the following areas of study: embroidery, fashion, print and weave. All first year students are given one hour and ten minutes on computers which is aimed at making them aware of the possibilities of "Word processing". In year two all "weave" students are taught how to use a weave programme. In the third year the students use the system more and have priority on the machines.

Courtaulds Leisurewear



Pattern generation by computer

fig. 4.5

The system used is produced by AVA CAD/CAM who also cater for printed and knitted textile design and supply firms such as "adidas" U.K. Ltd.; Norman Scott Woven Textile Design; and the Tootal Group among others. The software facilitates the structure of woven designs directly on screen. It is possible to define the number of shafts and threads, the selection of threading and the colours for warp and weft threads. It also provides for the introduction of fancy yarns into the design and the completed design can be modified and displayed in many colourways. The quality of the printouts are sufficiently realistic to convey the idea of the design so that actual woven samples only have to be made for the final choice of design.

The staff in the "print" field have not been prepared to allocate time to computer training for their students. Graham Worth felt that as 35% of their students' time is allocated to drawing and designing skills, the print staff could spare some time to computer training. Perhaps not surprisingly, only a few "print" students learn how to make use of the computer. Although I was told this information and was shown the computer room on my visit, the only person I saw working on a computer was an embroidery student who was being given help by her tutor in using a plotter linked to a computer with software which could convert a drawn design to stitch direction.

PRINTED TEXTILES
FIRST YEAR CAD PROJECT

October 1993

The purpose of this project, besides developing concepts "on screen" is to begin to make you aware of the potential of CAD/CAM in the design process.
The software is called Drawmouse and there are several elements to be covered.

1) DRAWING TECHNIQUES - The various functions in the Drawmouse programme for drawing with lines, brushes, pens and drawing with "texture"

2) COLOUR - Random colour changes, changing a specific colour within a design and colour separation

3) REPEATS - Copying and moving drawings on screen, putting designs into repeat (1/2 drop, unit drop etc.) for modular designs

4) SCALE - Scaling work by percentage, and "pixelating" a design (useful for constructed textiles)

5) COLLAGE - Incorporating different scales in one design, and overloading one image onto another

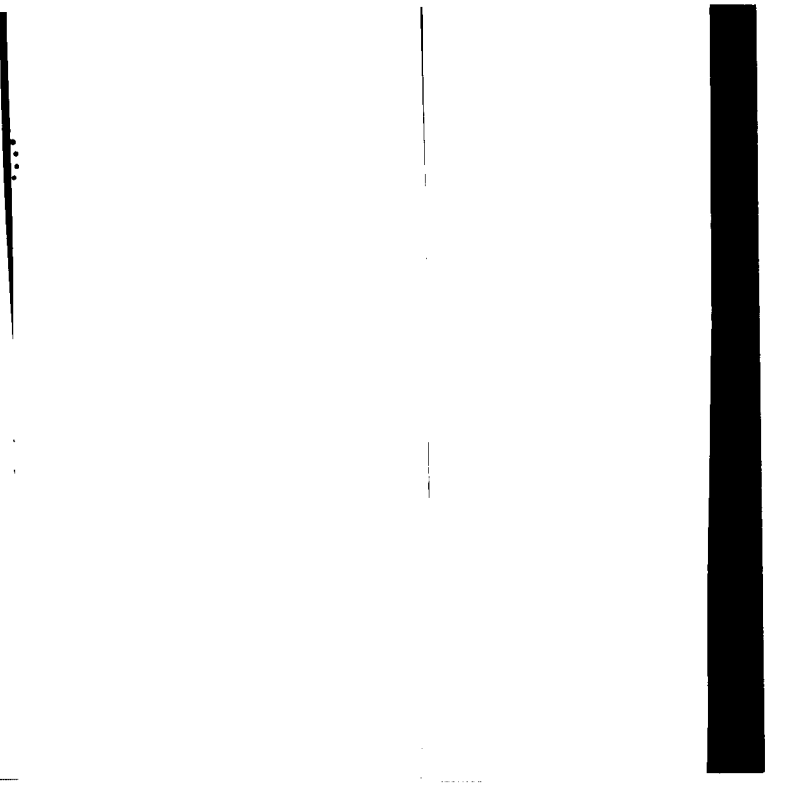
6) STORAGE - Storing and reading files and producing hard copy

Develop a complementary range of design ideas from your initial drawings/paintings - two are required - one in colour and one in black and white for further development with photocopies and collage techniques (this will be discussed at the beginning of the project). Your final design work should be A3 or A4.

Day 1	Introduction, developing drawings and paintings through the system
Day 2	Design colour and repeats
Day3	Morning - finalise ideas and print out (ink jet) 3pm talk/discussion "Beyond Drawmouse"

Reading List (see over)

fig. 4.6



Central St Martins'-
Work produced on computer by Year One students
a) Freehand drawings
b) Combining computer design with collage techniques

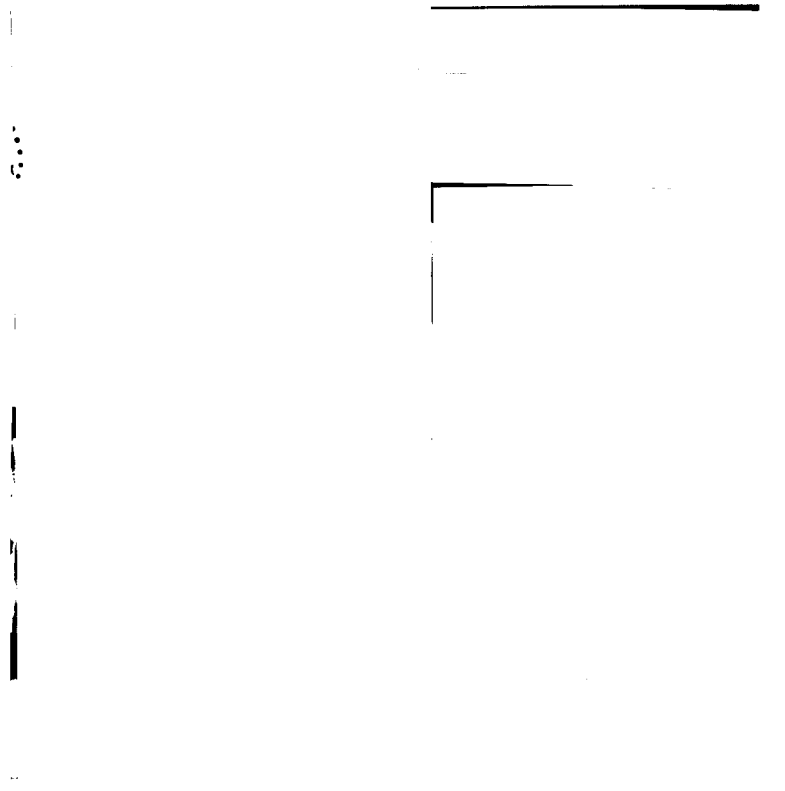


fig. 4.7

4.1.3 Central St Martins College

At Central St Martins all first year textile students take part, in groups of twelve, in a three day computer familiarisation project. During this they draw, make repeats, experiment with colour, scale, collage and storage on the computer, using "Drawmouse" software on a PC386 network. The students are expected to develop a range of complementary designs (see work sheet fig. 4.6) and these are developed further through photocopying and collage into textile designs. (see figs. 4.7 & 4.8) Following this, Malcolm Cocks gives the students a lecture entitled "Beyond Drawmouse" in which he begins to indicate how their use of the computer as a design tool develops into commercial design applications based on industrial systems in design studios.

Year two students have an optional course which previously used "Cameo Paint" software but which has been updated to use "ORMUS" software from Concept "Concept 11" and some aspects of an Italian software called "Treepaint" which can provide 136,000 individual colours and as many tones as wanted.

Central St Martins'
a) Full colour printout of design (detail)

b) Further developments of design

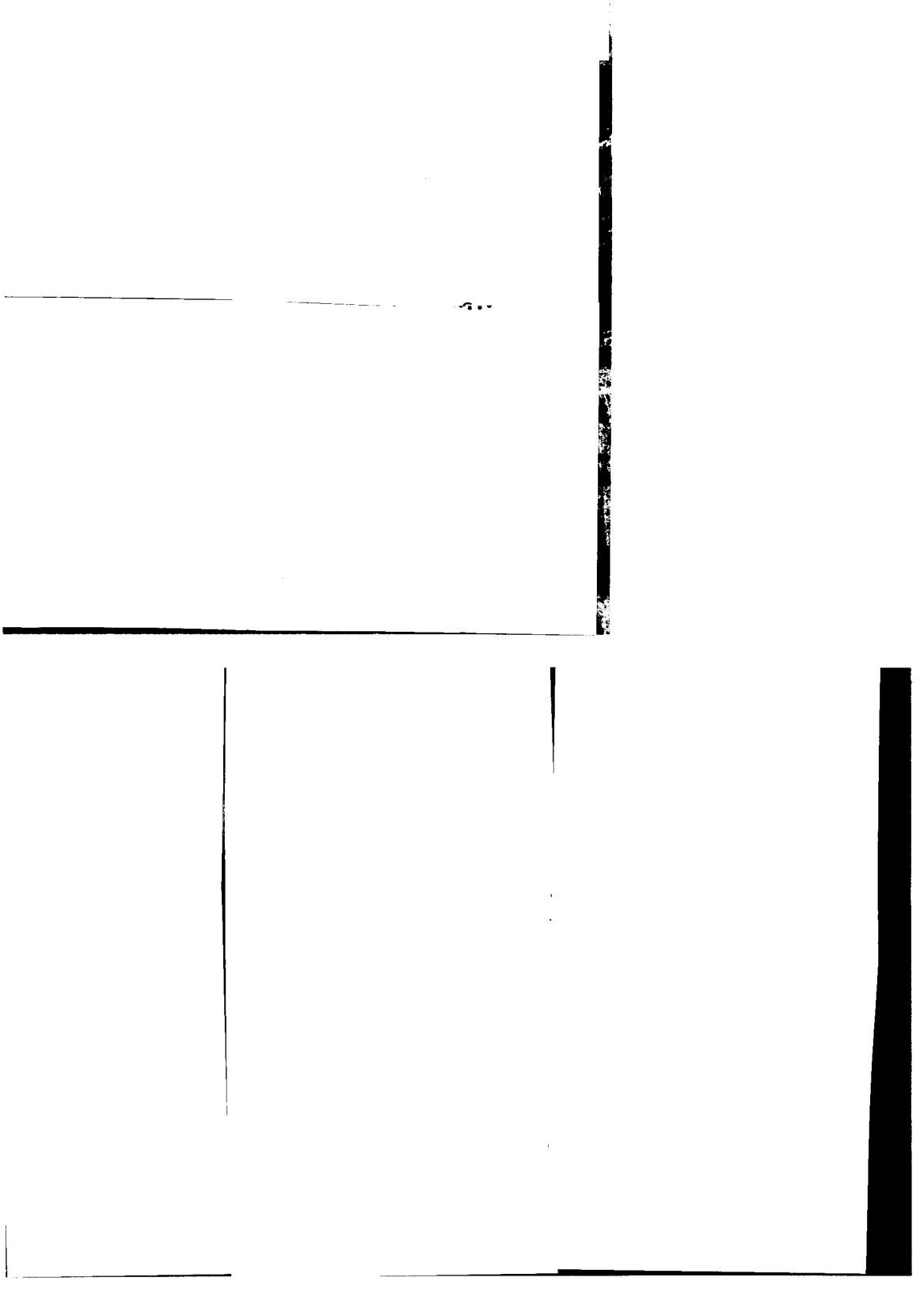


fig. 4.8

Among the more advanced software and additional peripherals available to the students are: "Designer Knit" which outputs to a Brother knitting machine; a ten gauge flat-bed knitting machine called a Shimatronic operated by a knitting system called TISS Electronic Modules; a Texel Jacquard sampling loom which interfaces with an Apple Mac Quadra 610 using French jacquard software called Point Carré and Textile Computer Systems software for printed textiles which outputs to various film plotters and ink jet printers. These enable the designs not only to be printed out on paper but to be printed out in separated colours onto film which is used in the production of the screens used in the fabric printing.

Because there is only limited access to these industrial standard systems, tuition in year three is given, in general terms, to all textile students and then to individuals, when and where appropriate. The majority of students who make use of this extra tuition are those studying Printed Textile design. There are also post-graduate M.A. textile students who have access to individual tuition.

Central St Martins'

a) Printouts of details of a design

b) Colour separation fo: orange screen and full colour printout

fig. 4.9

4.2 RESPONSES OF STUDENTS.

That computers have still not been whole-heartedly adopted by teachers of art in Wirral schools is evident. One of the reasons may be that the heads of art departments would not have experienced using computers as part of their training. However, the two teachers who responded to my questionnaire clearly would like to make use of computers as a design tool if only they had the time to acquire the knowledge. It will be useful to discover whether art students today feel positive about using computers.

Few of the students that I had the opportunity of speaking to had previous experience of using computers. However, one student, who had used them on her foundation course, said that when choosing which college she would apply to she was influenced by whether she could use CAD as part of her degree course. Malcolm Cocks is surprised that so few students come to him with any experience of using computers in art in school. He considers that it is an advantage for them if they have some familiarity with using computers as a creative tool.

The problem of lack of familiarity with using computers as a design tool lessens as students have increasing opportunities to use computers as part of their art

training. This is already the case in the courses provided for students of art textile design at Liverpool John Moore's University, Manchester Metropolitan University and at Central St Martins College.

I was able to see examples at this year's degree shows of use being made of computers in design. I also spoke to students at Manchester Metropolitan University's show. Although there was less evidence of the use of computers than of traditional drawing and painting methods of designing, all the students spoken to showed a positive appreciation of the advantages of using computers. It was also evident that students were using computers in designing for embroidery and print as well as weave.

One student's main project had made use of a "Multi-head" embroidery machine to reproduce her "rose" design in many alternative sizes and colours. She had received several commissions for further work like this and had plans to work with the carpet and textile design company, "Stoddard Sekers" in their computer design department in Scotland. Another student had produced vivid print designs and printouts a metre wide, with the help of R. A. Smart(CAD) near Macclesfield. A weave student explained how helpful the computer was in visualising designs and alternatives so that an informed decision could be made before setting up the loom.

None of these students were planning to go into teaching so I was interested to have the opportunity of seeing the work of textile students at Edge Hill College of Higher Education at their degree show. Once again, the use of traditional design methods and materials predominated but there was also evidence of interesting designs having been produced on computers.

I was invited to provide a questionnaire for the textile students to complete and the results from this (see appendix 4), would indicate that all but one of the twenty students had formed a positive opinion of using computers as a textile design tool. Seven of these stated specifically that they would like to use computers as a design tool with their pupils once they started teaching. Only one student was definitely against doing this, giving as her reason: "I don't feel competent enough myself". This was also the student who had not enjoyed using the computer as a design tool. The reasons given in the positive responses were as follows:

> "Introduces children to more variety of computer techniques, gives confidence to children who aren't particularly confident in drawing."
>
> "to widen their experiences in terms of manner of working, the media in use. Also to create opportunities for those children with S.E.N.s either gifted or with learning difficulties to develop their perceptions of colour, discernment."

"Have the experience offered by computer design as expressed in question 11 of the questionnaire. Advantages outweigh disadvantages."

"Its free, you get results quickly."

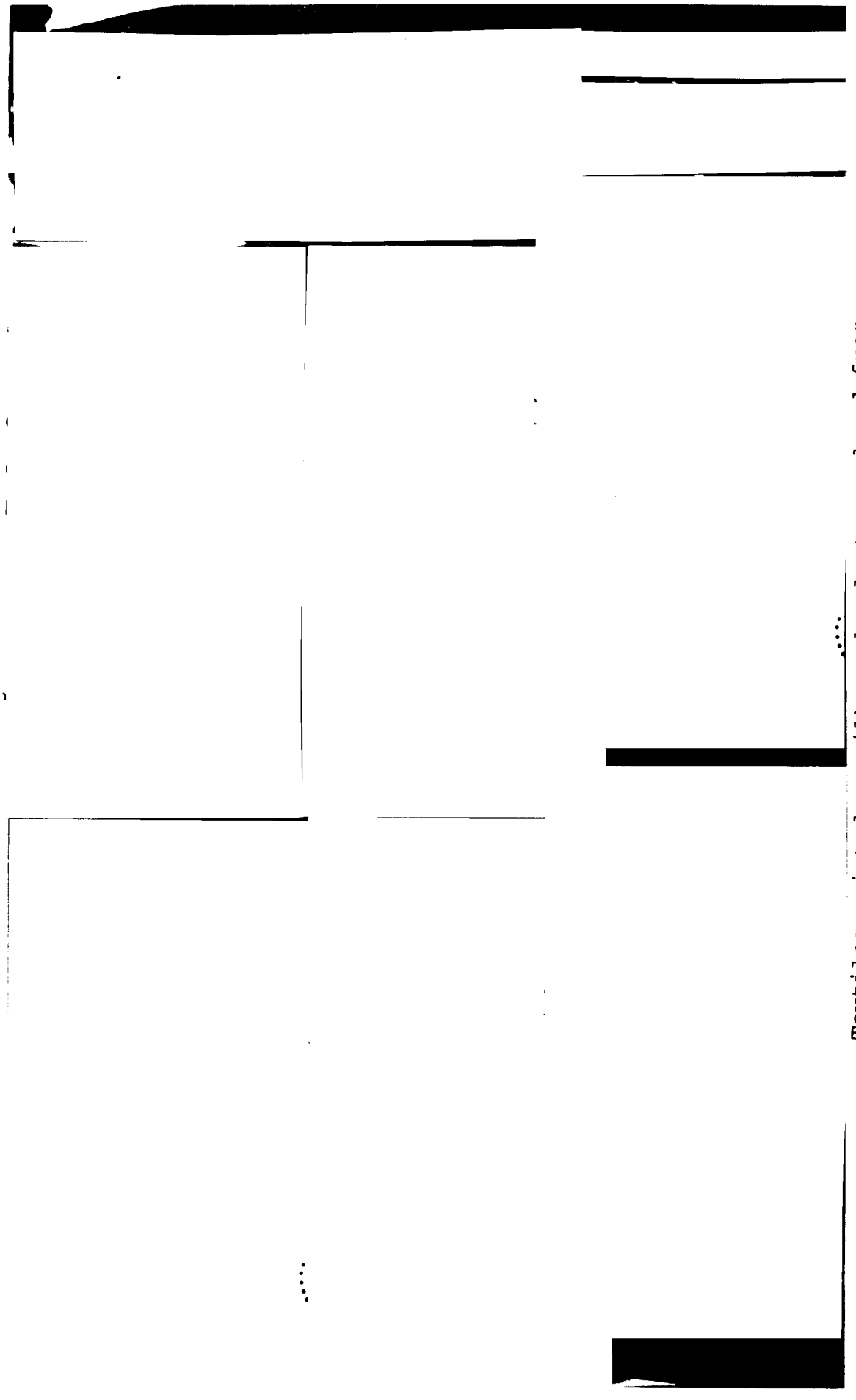
4.3 RESPONSES FROM THE TEXTILE INDUSTRY.

Apart from the inference that may be drawn from the fact that many Higher Education design courses include the use of computers as a design tool, and the largely positive responses of the students, the lecturers to whom I had spoken all felt that training in the use of computers formed an essential part of the course.

There are signs that even the Government is persuaded of the importance of computers in textile design. Malcolm Cocks, who lectures at Central St. Martin's is collaborating with University College London on a computer project funded by the Department of Trade and Industry. This is a project with LINK sponsorship where the Government and industry share the costs. Cocks says these will probably reach £10,000,000. The aim is to produce a weave/print "workbench" which will include 3D modelling and "cat walks" for the textile and fashion industry.

Within Central St Martins, Cocks is working with designers to develop a three year course for CAD/CAM. He thinks that this will take about five years to develop. It will be multi-disciplinary, starting from a design course. Cocks feels that there is also a need for multi-disciplinary, interchangeable knit, weave and print software. Another area that Cocks would like to see developed is that of printers for textiles. At present the spray jet printers available only spray on cotton fabric and their colour matching capabilities are poor.

The textile industry employs 5% of the working population of the British Isles. Although many people have been made redundant because of competition from the Far East recently there have been reports of thriving British textile firms. Some thrive because they have made use of modern technology, including designing with computers, so that lead times can be reduced, prospective customers provided with good quality samples and swift reactions made to changing trends. Other companies have concentrated on very high quality specialised runs of fabric for design houses such as "Zandra Rhodes". "Patricia Belford Prints" near Macclesfield is one such firm. It is here that Malcolm Cocks has his textile designs turned into a reality.



Textiles printed on silks and velvets produced from Malcolm Cock's computer generated designs.

fig. 4.10

The firm is one of several companies that I visited, formed by R. A Smart an engineer, whose initial interest was to sell an Italian lazer plotter to the textile industry in this country. Smart decided that it would promote sales if he could show how the lazer plotter might be used. Apart from Belford Prints he set up a screen making company and another, R.A. Smart (CAD), which uses computers and Italian textile design software "BTree".

The work commissioned from R.A. Smart is varied. It includes designing wall or floor coverings which can be displayed in a room setting, textiles such as souvenir scarves for Belfast Airport, and uniforms for companies like Nissan and ASDA. Designs can be scanned in from existing artwork or can be created directly on screen, re-scaled, modified by substituting elements, changing the repeat or colour way, or by overlaying different textures.

The company also provides a bureau service so that other companies or designers can buy computer time to develop their designs. Designs can be produced as colour separations using the lazer plotter and screens are developed from these. The consistent advantage provided is the speed at which all these processes are completed compared with traditional methods. The costs incurred

are easily recouped as instanced by the example of one company which was charged £300 for a day's bureau service but which was then able to sell each of the twenty-five designs developed at £300.

The Textile Institute based in Manchester also supports the developing use of computer aided design. They have held conferences for several years, such as the one in 1991 entitled "Investing in Design by Computer", to disseminate information about computer hardware and software available to the textile industry. Speakers range from the individual specialist designer to representatives from companies like Courtaulds and the International Wool Secretariat.

Further evidence of the importance of computer aided design to the textile industry can be found in the articles in the Textile Institute's journal "Textile Horizons". In one such there were two articles specifically about computer design. Watkins (1991), finished her article by saying:

> "The future for textile design must lie in a wider use of CAD/CAM systems...Already...computer aided design is producing interesting work and distrust is starting to be replaced by enthusiastic acceptance."

In an article significantly entitled "Insight into a design essential", Holmes (1991), points out:

> "Schools, colleges and universities are already using CAD on an ever increasing scale within design education and it is inevitable that, when today's students enter the industry, they will wish to make full use of this tool and feel confident enough to do so."

4.4 SUMMARY.

In Higher Education there seems to be considerable support for the introduction of computers into Art courses. At Central St. Martins it is considered to be essential that all Graphic Design students become familiar with the use of computers. Lecturers in Textile departments are not as wholehearted in their support although those at two of the most influential colleges are. Perhaps this is due to the fact that whereas the commercial graphic design world requires an Apple Mac environment using "Quark Express" and "Photoshop" software, 60% of the UK textile industry does not use computers. Those who do, use computers mostly for coloration and repeat work rather than for designing. The attitude in the rest of Europe and in the United States, according to Malcolm Cocks, is very much more positive towards CAD/CAM.

It is clear that Higher Education has seen that CAD must form an element of their courses. It is encouraging that

the future teachers were largely positive in their responses as were the future textile designers that I talked to. Here too though, there is some frustration over the lack of time and resources and some disappointment that so few students arrive having had experience of using computers as tools in their school art lessons.

Meanwhile, the Textile Institute is working to influence the textile industry into a greater appreciation of the benefits of CAD and the Department of Trade and Industry is joining with the textile industry to support the development of the use of computers in design.

It would seem, therefore, that we are at the beginning of a change in the perspective of how computers may be used. Malcolm Cocks, for instance, who is also a practising designer, is very optimistic and enthusiastic about the place of computers in textile design. As he says, it is a new and exciting field and, although he does not feel himself to be in a technological race, he feels that he is using what is available, creatively.

Courtaulds Leisurewear designers

Using traditional methods.

In the computer room.

fig. 4.11

CHAPTER 5

PILOT STUDY - BACKGROUND.

5.1 APPROACH OF SOUTH WIRRAL HIGH SCHOOL TO INFORMATION TECHNOLOGY.

5.1.1 Pre National Curriculum.

South Wirral High School became in the mid 1980s, well equipped for Information Technology, thanks to the amalgamation onto one site of the equipment from two secondary schools which had previously been part of the Wirral TVEI scheme. Unfortunately, since that time there have been severe cuts in the educational budget and the equipment is now more than a little out of date.

There are two I.T. rooms equipped with BBC Masters and black and white printers; a business studies suite with a small network of five R.M. Nimbus 186 machines, and a network for the BBC computers that extends to all classrooms except four mobiles. For these there are stand-alone BBC computers available.

For several years, there has been talk of investing in a new network of PCs to be installed in one of the existing

I.T. rooms. The idea was that this could be booked by other subject teachers so that whole groups could be taught there as necessary, perhaps for a module lasting several weeks. Following this, pupils could use stand alone machines which would be made available in various areas of the school. However although PC computers and printers were continuing to drop in price, money to implement the scheme was not available.

Until the advent of the National Curriculum, pupils were given a limited introduction to computers in years 1(age 11) and 3(age 13). This course had originally been associated with the Business Studies department and called "keyboard skills". For the 14-16 year old pupils there was a GCSE course in I.T. which attracted many pupils but poor results were achieved. In 1992 GCSE I.T. was dropped from the option courses offered.

5.1.2 Post National Curriculum

With the impending introduction of "Technology" in the National Curriculum in 1990, there was considerable discussion as to how to provide for AT5 (see chap. 2) and prepare pupils for the end of key stage testing. During the lead up to the introductory year of Technology for the eleven year old pupils, now called Year 7, all the following subjects were represented at the planning

meetings: Art, Business Studies, Craft, Design and Technology, Home Economics and Information Technology.

The Senior Teacher leading the debate, a historian, had interpreted the Technology orders to mean that all teachers of the aforementioned subjects would not only be called Technology teachers but would, in fact, teach the same material. The teachers themselves were seriously concerned about the likelihood of de-skilling.

The whole Technology debate created considerable anxiety as departments worried about, not only job security, but the validity of their subject. Much depended on the personality and power of those involved. In the event, the senior teacher originally responsible for the organisation of Technology gained promotion to another school and the first year of Technology was rather differently introduced.

The new year 7 (age 11) pupils were taught "Design and Technology" to meet the requirements of AT 1-4 by teams of paired CDT and Home Economics teachers. The timetable was organised in blocks so that the classes could be taught in either four or two period sessions. The teaching was modular and usually planned so that specific skills were taught first by both CDT and Home Economics. After this the pupils opted to work in one of

these subject areas to solve a more open ended problem and this would take place in a four period block. Meanwhile, the Design and Technology work was supported by the other Technology subjects to varying degrees.

Business Studies and Information Technology worked together to create a combined course which catered for the requirements of AT5. This was taught in two periods a week. At specific times, to coincide with the appropriate Design and Technology modules, the use of data bases and spread sheets was introduced. Similarly, the Art department was requested to co-ordinate the timing of certain work such as lettering design and colour work with Design and Technology projects.

The Art department chose not to be more closely involved with the Technology courses for several reasons. We were awaiting our own specific National Curriculum orders and our teaching methods were habitually much more open ended and less tightly scheduled than those of Design and Technology, with their 2, 4 or 6 week blocks. We had our own place in the National Curriculum and our allocation of curriculum time remained at two periods of Art a week for each year 7 (age 11) class. As successive versions of National Curriculum orders have been produced for both Art, and Technology, the less has seemed the pressure to become totally assimilated. As previously stated, there

is a requirement, for both areas, to include Information Technology. Looking at the work of designers, past and present, and therefore presumably their methods, is also required. If computers are becoming a tool for designers of today they must surely be introduced as a tool in schools.

The system for providing for the teaching of "Design and Technology" which was introduced in 1990 with the first cohort of year 7 (age 11) was continued when they moved up into year 8 (age 12) and year 9 (age 13). Because of pressures on the curriculum the position of I.T. has been deemed to be expendable as a discreet subject in year 8 and instead is expected to be taught across the curriculum. In year 9, I.T. reappears on the timetable but only for one period a week. The purpose of this is to prepare the pupils for the end of key stage tests. The situation for year 10 (age 14) is to be reconsidered once the revised "Technology" requirements become clearer. Until then, all pupils in year 10 will follow a GCSE Design and Technology course and AT5 provision will be through single periods of I.T.

Year 8 continue to have two periods of Art a week but the Design and Technology teachers no longer ask for any supporting work. In year 9, Art is involved in an option system with Drama and Music which seeks to preserve the

position of Drama whilst maintaining the legal requirement to provide Art and Music teaching until the end of the key stage. The pupils opt for one of these three subjects which they take for two periods a week for the whole year. The other two subjects are taken for two periods a week but for half the year each. The emphasis in all areas is on the performing arts and involvement with I.T. is incidental. In year 10, pupils have the possibility of opting for any one of three endorsed Art GCSE courses in the "Creative" option block of seven subjects. The art courses are Drawing and Painting, Three Dimensional Studies and Textiles.

5.2 TEXTILES WITHIN ART

The textiles course being discussed here is Art Textiles as opposed to that of Home Economics. In the art course the emphasis is on designing for and decorating fabrics which then might be constructed into furnishings, clothes or accessories. Conversely, in Home Economics Textiles the emphasis is on the attributes of different fabrics and the construction methods used for making clothes and toys.

The Art department at South Wirral High School has offered Art Textiles as a specific option since the introduction of TVEI courses in 1983. The main emphasis

has been on screen printing although this has often been combined with other techniques such as batik, both wax and paste resist, tie and dye, block printing and spraying. Most of these latter techniques are of very ancient origin. Although dyes and fabrics have changed, the methods used in school remain largely those of tradition, when time was perhaps less pressing than today.

The technique of Screen printing is Japanese in origin but is a relatively new method for artists in the West, being used for printing on either paper or fabric since the middle of this century. Previously, large lengths of decorated fabrics and wallpapers had been produced by hand block printing. This was later industrialised and the process accelerated by using etched metal cylinders to roll the design over the fabric.

To produce lengths of print by either method requires the development of a repeating motif. Ideas for the initial motifs could come from any source, they may be based on careful observation drawing or developed from the simplest forms such as a collage of torn paper shapes. The designer must select and experiment with the area, size, colour, texture and repeat. The traditional methods for doing this: drawing, painting, tracing, cutting and pasting, and using templates and stencils, are

satisfying but very time consuming. Already, artists have sought ways of speeding up the process by, for instance, using photo-copying instead of tracing designs, and photography for capturing images and preparing screens.

Table 5.1

EXAMINATION RESULTS FOR GCSE ART TEXTILES AT S.W.H.S.

Year	No. pupils entered	No. grades A-C
1989	29	15
1990	16	8
1991	11	5
1992	14	7
1993	11	4
1994	10	5

As can be seen from Table 5.1 the numbers of pupils entered in 1989 was greater than in subsequent years. These pupils had been taught as two groups. Compared with the I.T. groups often of twenty or more pupils, the GCSE Art Textile groups were small but the results were quite successful. However, although the groups were small, it was difficult to help each pupil understand the many possibilities of creating repeats. The processes of designing for screen printing take so long that it was impossible to experiment sufficiently with alternative colourways or patterns of repeat. As I had inherited a

department very well equipped and with a strong tradition in screen printing, I was interested in overcoming the problems of lack of time.

One change that I decided on was the earlier introduction of pupils to textile design and decoration. It seemed to me that if pupils arrived with more background knowledge in at least some of the techniques then they would have more idea of what they were opting for in a GCSE Art Textile course. They would also be able to spend more time on designing and combining techniques with which they already had some familiarity. The second change was brought about by the decision of the Head teacher explained earlier. This was that, instead of I.T. being given specific timetabled periods for year 8, all subjects would be responsible for incorporating I.T. into their year 8 scheme of work. As previously stated, I felt that both the Art department and I were ill-equipped to do this but steps should be taken to rectify the situation.

5.3 THE ACQUISITION OF HARDWARE AND SOFTWARE FOR THE ART DEPARTMENT.

Although the Art department had been provided with a BBC "Master" computer and an "Epson" black and white printer in 1990, this was for the purpose of generating pupils

reports according to the school system. The BBC did not have the capacity to cope with an adequate Art programme for our requirements. We began gradually to acquire more suitable hardware and software in 1991.

The first priority seemed to be to acquire a suitable computer. As our capitation was very limited we would have to "make do" with our black and white "Epson" printer. Eventually, after making enquiries I heard of an R.M. NIMBUS 286 floppy disc machine in school that was not being used. I was advised that for paint programmes to run effectively on this computer, the department would need to pay for a 40 megabyte hard disc to be installed. This done, I now had to find suitable software for my purposes and the time in which to teach myself how to use it as there was no likelihood of any INSET.

The summer holiday of 1991 was spent at home with the new computer on which had been installed assorted software but for which I had not been given any instructions or handbooks. It was a very frustrating beginning which, in the absence of any computer literate colleagues, seemed likely to continue for the entire six weeks. In desperation, as the monitor screen filled with ever more shapes that I did not seem able to delete, I seized on the idea of asking the local authority's audio visual

department for help. The department repairs computers and associated equipment for Wirral schools and provides advice when systems give trouble. I telephoned and asked if anyone could provide me with some basic instruction if I took the computer to them. Instead, one of the technicians came to me and not only did he show me how I could begin to work with some of the programmes already installed, namely "Arts and Letters" and a very basic black and white paint programme, but he also showed me a programme called "Deluxe Paint II Enhanced" and recommended that I try it.

5.4 INITIAL USE OF THE COMPUTER IN MY ART ROOM

I bought "Deluxe Paint II Enhanced" and, to my delight, when term started in September 1991, I found that many of the children were already familiar with a very similar, if slightly more sophisticated version of the programme. This was because they had "Amiga" machines at home which they used mainly for playing games but which also had "Deluxe Paint 4" installed. The children showed so much enthusiasm for working with the computer, that I had to organise a rota system in lesson time and a booking system so that the computer might be used at lunch times.

The year 8 (age 12) groups were involved in a long term project based on looking at Japan and its culture from

which they developed simple designs for screen printing onto fabric. In one class the children worked in groups with the ultimate aim of designing, printing and making kimonos. Another class designed and made printed kites. As part of their work each child worked with a partner on the computer to develop an alternative kimono or kite design. At lunch times the children were allowed to experiment freely, using "Deluxe Paint II Enhanced".

This initial work was with year 8 (age 12) groups but gradually, as I became more familiar with the programme's facilities, it became clear that the computer could become a useful tool for the GCSE Art Textile groups to use too.

The computer not only makes the investigation of the possibilities of different arrangements of repeats and colour-ways very quickly accomplished it also has the added facility of saving each successive exploration if so desired. Once saved these can be recalled at will so that nothing need be lost and every idea may be re-examined; a facility much advocated by Smith (1993)

5.5 SUMMARY

There have been many changes in the approach to I.T. at South Wirral High School as successive educational initiatives have presented themselves. The school has also endeavoured to keep pace with advances in hardware by firstly installing a network of BBC Masters and black and white printers. Then, as funds have become available, the school has begun to upgrade to PCs, scanners and colour printers. The National Curriculum has provided a major incentive for the wider use of I.T. across the curriculum.

The Art department at South Wirral High School has a tradition of offering a textile course at GCSE level. The pupils' abilities vary but they regularly achieve better results in this course than in any other subject for which they are entered.

The Art department's need to introduce the use of I.T. in order to comply with the National Curriculum, lead to the acquisition of basic hardware and some appropriate software. After using computers in year eight courses as required by the curriculum, it became apparent that the use of computers could have relevance to the pupils studying GCSE Art Textiles.

CHAPTER 6

PILOT STUDY - IMPLEMENTATION.

6.1 PILOT STUDY - STAGE ONE, USING "DELUXE PAINT IIE" WITH GCSE ART TEXTILES PUPILS.

The use of I.T. during the GCSE Textile courses in Art at South Wirral High School was influenced by a number of constraints. These included the pupils initial lack of experience of textile techniques, their equivalent lack of computer experience coupled with my inexperience of using computers as a design tool. In addition the use of I.T. in these courses was limited by the hardware and peripherals available.

With both groups the hardware available was a stand-alone "R. M. Nimbus 286" as has previously been explained. Initially, attached to this was an Epson, black and white printer. The use of the rather unclear printouts that this produced was limited to colouring by hand to produce alternative colourways.

RLU TEXTILES
LOOKS AT

fig. 6.1

...Japanese
...printed
...own choice
...objects,
...used.
...of it. Trans
...of nature,
...provided,
...the colours
...the computer if you have
...of your drawings of both man-ma
...and natural th..., draw out your design. You should
consider whether you need to enlarge or reduce ya
drawings. The photocopier can help with this.

You will also experiment with repeat patterns.
Many Japanese designs are built up on a squ
or hexagonal grid. Look at examples of
traditional Japanese Patterns in these books -
'Japanese Patterns' and
'Japanese Patterns 2'. Mak
a copy of a portion of on
that you like.

6) When your design is ready you need
Paint it in 2 or 3 different colourschemes.

I had already had the experience of working with two previous GCSE Art Textile classes and was very aware of the problems associated with completing sufficient work in, what amounted to, barely an eighteen month period. In an effort to cope with this, I had decided to start the new GCSE class to be known as ATEX1, with designing for the major project of screen printing right at the beginning of the course.

When I introduced this group to the possibility of using the computer, I was a novice myself. My initial aim was, very simply, to convey to them how fascinatingly, simple shapes could build up into a design when they were repeated. To do this, I showed all the group how to switch on the computer and printer and how to access the Art department's programme, "Deluxe Paint 11E". I then demonstrated to the group how the mouse worked and how they might use different types of line, brush and fill, in the colour of their choice. (see screen dumps A, B and C in appendix 2) Another important piece of information was how to get rid of unwanted marks! Armed with this, they experimented in pairs to get the feel of using these basics.

Once the pupils of "ATEX1" had experimented a little and were familiar with how to control mark making on the computer they were introduced to the first, simple, computer based project which was to use the "symmetry"

tool. This has three main aspects; "cyclic", "mirror" and "tile". (see screen dump D in appendix 2) The pupils were asked to experiment with the tile facility to discover something of the development of design through repeated shapes. This was to support the work that they were going to do in their screen printing project. (A work sheet and a photograph of some design ideas from this project is shown in figure 6.1.) For this they were to develop repeating patterns based on drawings previously made of Japanese artefacts.

Some of the pupils in "ATEX1", earlier in their school careers, had experienced using paper stencils for screen printing single images on T-shirts but none of them had developed designs built up from repeating motifs. As this process can transform a design, it seemed useful for them to have an insight into the benefits of experimenting with the effects of repeating motifs and the new linking shapes that would result. Ideally, they would also be able to have time to experiment with developing different colourways.

As previously explained, the printer available at that time was only capable of printing in one colour. All we were able to do was to change the ribbon so that there was the possibility of seeing the design printed in red, blue or green as well as black. These one colour printouts could then be coloured with pencils or felt

pens to show how the design could be varied. The pupils enjoyed doing this but it took too much time to be really satisfactory when one of the purposes of introducing the use of the computer was to achieve varied repeats more rapidly. However, very briefly, we were lent the Canon PJ1410 colour printer, which much later we were to acquire permanently. This enabled us to use the "fill" tool to change design colours quite significantly and print them off. It provided an indication to us all, of how much better a colour printer would fulfil our needs.

Meanwhile, the group members were developing observation drawings into designs for screen printing using the traditional methods of tracing or photocopying, cutting, manipulating and pasting. These designs were also painted with gouache to show a variety of colourways.

The limitations of the black and white printer were a continuous frustration as the pupils compared the clarity of their designs on screen with the rather muddled, fuzzy grey print-outs. A further limitation was the size of design that the computer provided. This was limited to A4 print-outs and the largest tile repeat was 240 width and 160 height in pixels.

SUSAN LE GUEN - DELUXE PAINT 11 E - TILE DESIGN - FLOWER.PCX - PAINTBRUSH PRINT

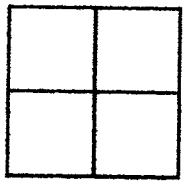
esigns developed
Susan Le Guen
CSE pupil SWHS

fig.6.2

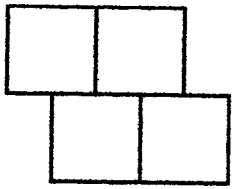
In addition, "Tile" provides the most basic zero block repeat. (see fig. 6.2) Although watching designs develop using this would help convey the power of repeating shapes it would not help the pupils to understand that by re-positioning a motif's overlapping areas even more satisfying designs could be achieved. Repeat motifs can take many other formats; diamond, triangle, scale, ogee, hexagon, as well as squares and rectangles. These latter motifs can be arranged in block, brick, quarter drop, half drop and unit drop repeats. This information was traditionally provided for the pupils as printouts (see fig. 6.3) and templates.

To try to overcome the shortcomings of "tile" I showed the pupils how another feature of "Deluxe Paint IIE" called "brush", could be used to select an area of a drawing and used like a "stamp" to position the design as desired. (see fig. 6.4) This took a steady hand and a good eye. Later we discovered that a "grid" could be set up which controlled the positioning of each motif. (see fig. 6.5)

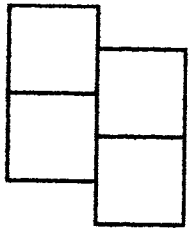
BASIC FORMS OF REGULAR PATTERNS



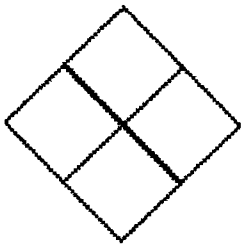
SQUARE



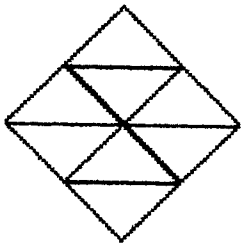
BRICK



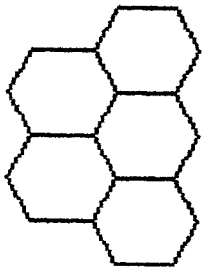
HALF-DROP



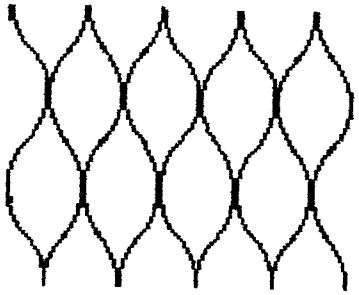
DIAMOND



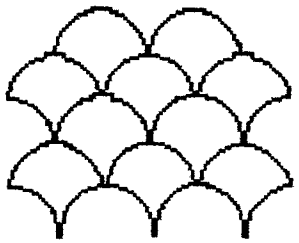
TRIANGLE



HEXAGON



OGEE



SCALE

fig 6.3

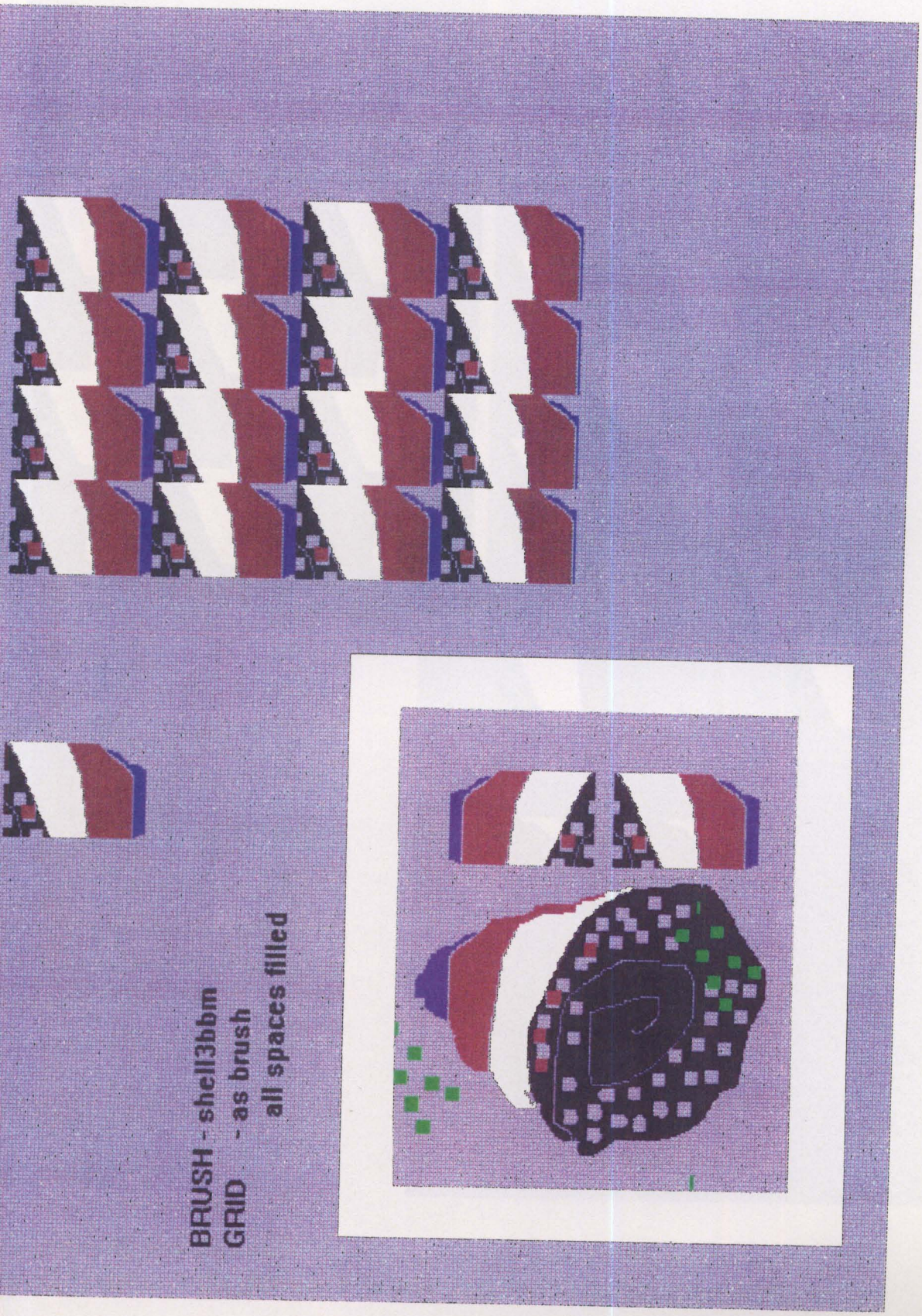


fig. 6.4

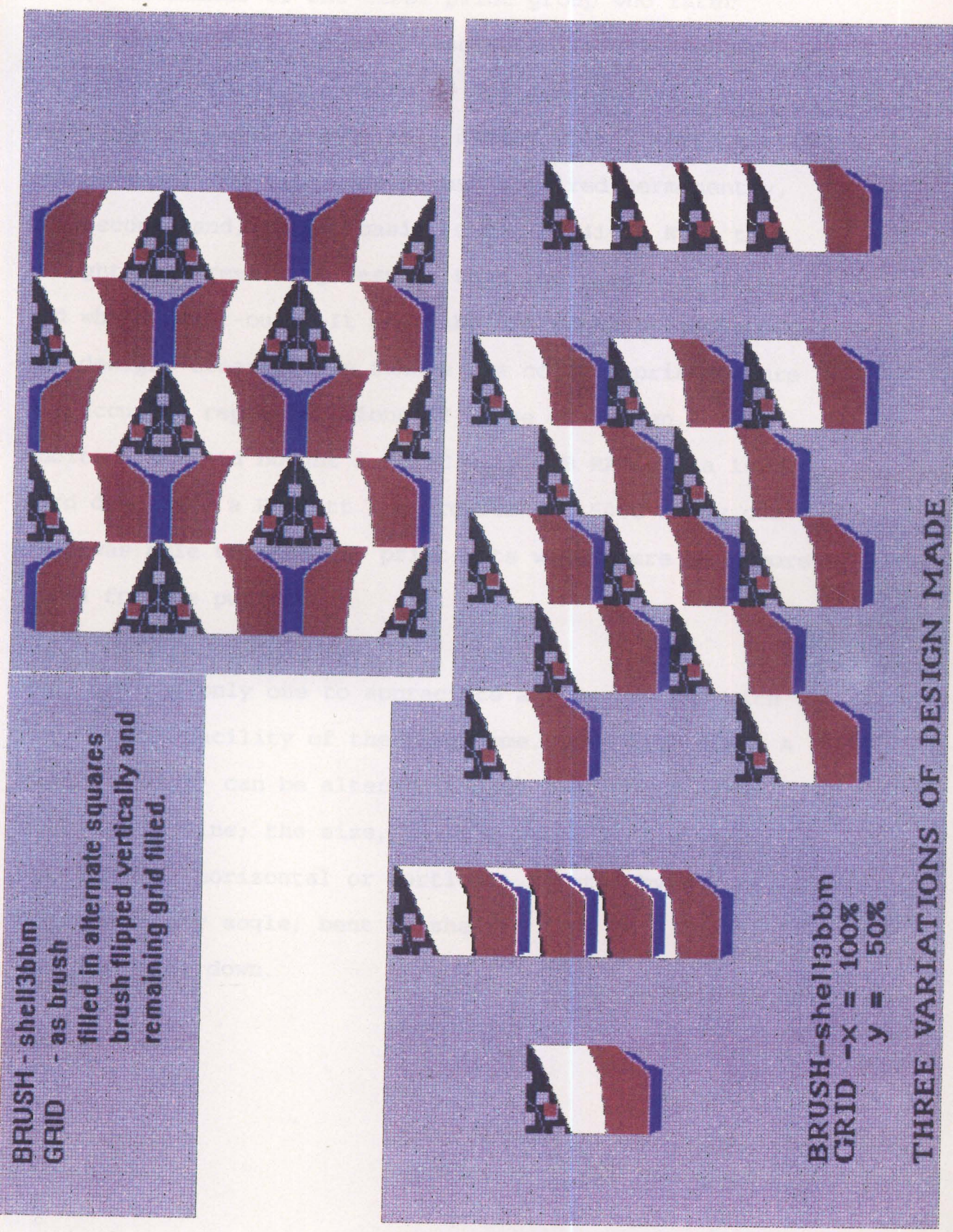

BRUSH - shell3bbm
GRID - as brush
filled in alternate squares
brush flipped vertically and
remaining grid filled.
BRUSH-shell3bbm
GRID -x = 100%
y = 50%
THREE VARIATIONS OF DESIGN MADE

fig. 6.5

Paul, one member of the first pilot group who later achieved a Grade A, became fascinated in the second year of his course, in spite of its limitations, by using our computer system as a design tool. Perhaps this was because, by this time we had acquired permanently, the second-hand, rather basic, Canon PJ1410. Even this brought more rewarding results than the previous black and white print-outs. It made the different elements of the designs clearer even though the colours printed were not accurate representations of those on screen. In addition, I had bought a 386PC with 4MB RAM and a 100MB hard disc, and a Hewlett Packard Deskjet 500C of my own so I was able to produce print-outs which were much more vivid for the pupils.

Paul was the only one to appreciate and experiment with the "brush" facility of the programme. (see fig. 6.6) A "brush design" can be altered in many other ways; from solid to outline; the size, in proportion or distorted; orientation, horizontal or vertical; rotated by 90, 180 degrees or any angle; bent or sheared from left to right or upwards or down.

Starfish design printed on Hewlett Packard DeskJet 500C

fig. 6.6

Paul Webster -

Photographs of design sheet showing computer developed designs leading to enlargements painted in gouache, printed experiments in different colour-ways and finally a printed length.

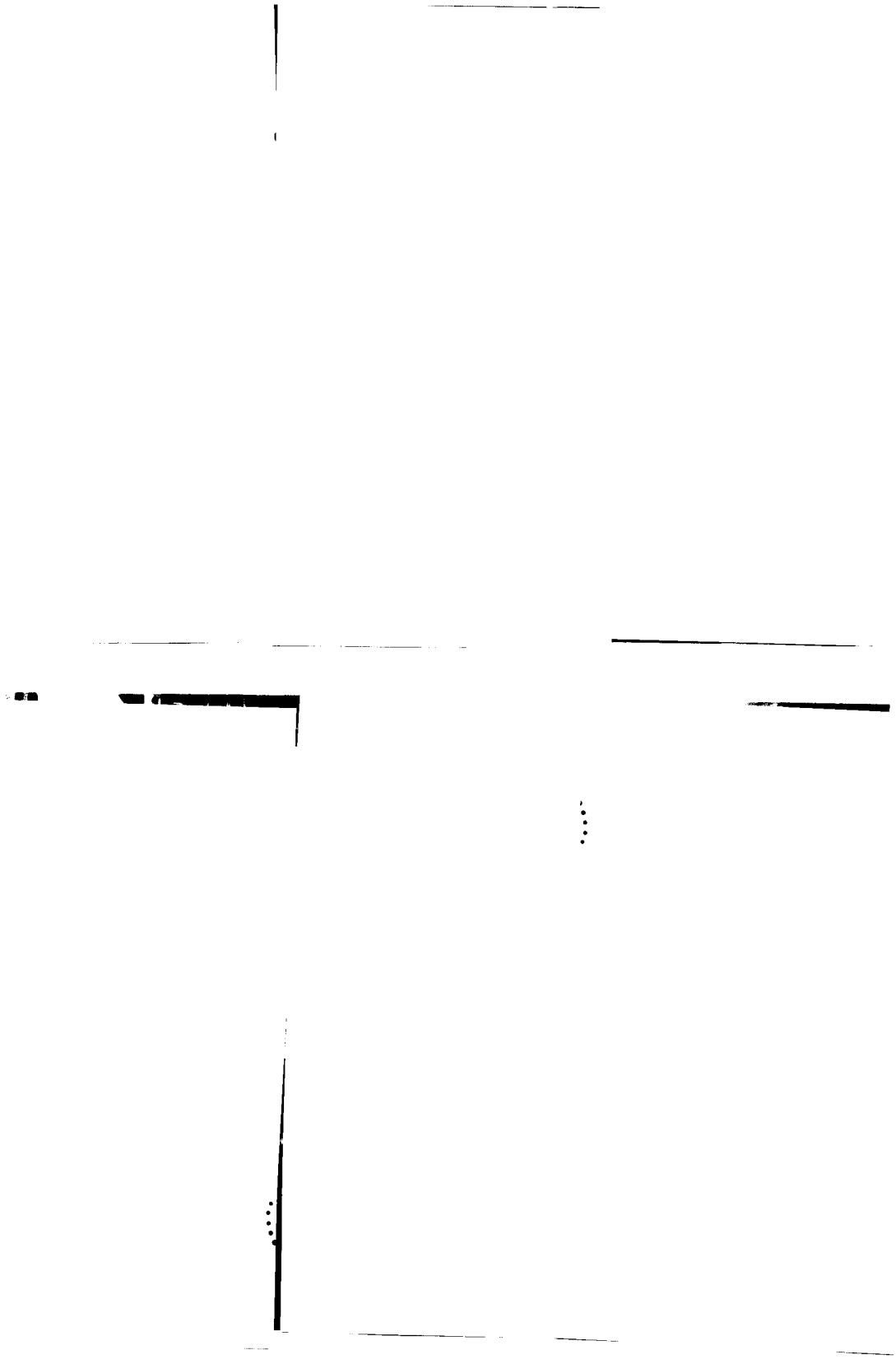


fig. 6.7

Having discovered that he enjoyed working with the computer, Paul went on to produce experimental designs on the computer for each of the textile projects on which he was working (see figs. 6.6 & 6.7 and further examples in appendix 5). Towards the end of his course he also benefited from a new facility which I was investigating with the help of one of the school secretaries. This facility was that of "scanning in" drawings using the office black and white scanner about which more will be said later.

6.2 PILOT STUDY - STAGE TWO, DISCOVERING "DRAWMOUSE".

Although "Deluxe Paint IIE" was quite powerful and provided some useful ways of extending designing for textiles it had not been designed specifically with this in mind. I was interested in investigating "Drawmouse" which had been. To do this, in the summer of 1992, I visited Judy Foulsham, a consultant lecturer in computer-aided design who had, as a textile student at Chelsea School of Art and Design, with the help of the technician John Couch, developed this textile friendly software. I had arranged to be given an hour long lesson on using this new software which proved to be a useful introduction.

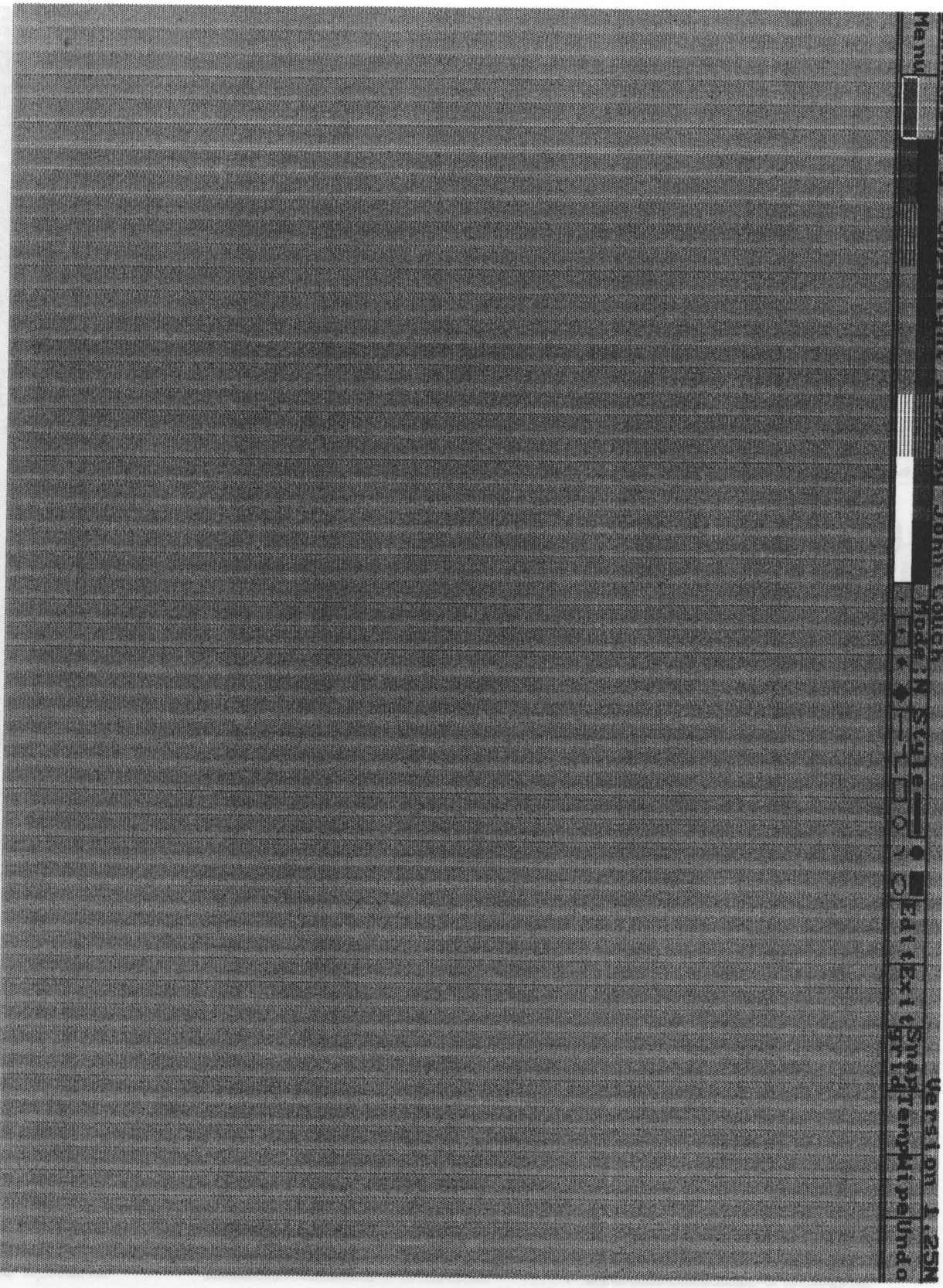

DRAWHOUSE 2 Copyright 1982 by John Couch
Version 1.25N
Menu
Draw IN Scale
Edit Exit Snap Grid Temp Hide Undo

fig. 6.8

Fig. 6·9

"Drawmouse" has a rather amateurish appearance on the screen, (see fig. 6.8) but it has a couple of particularly useful aspects as far as textile design is concerned. The first of these is its repeat facility which allows the designer to select an area of the design or picture on screen, and then choose the manner in which it is to be repeated. It is important to adapt to the "Drawmouse" quick release method of selecting a starting point for the area, which is different from "Deluxe Paint" which requires one to hold down and drag the cursor until the area is selected. The repeat options are Brick, Zero drop, 1/4 drop, 1/3 drop, 1/2 drop, 2/3 drop, 3/4 drop, Unit drop. Instantly, the screen fills with the repeated design. (see fig. 6.9)

There are two other facilities on the repeat toolbar. "Redo rept." allows one to redo the repeat after first having added new details as is shown (fig. 6.10) where the hard edges of the repeats have been softened by shading. The repeats are superimposed exactly on the previous design but the new details are added to all the motifs. "Redo area" allows one to select a new portion of the original motif which will then be repeated in the chosen option such as "brick". In this example (fig. 6.11) a more open design has been created by selecting a smaller area of the original motif.

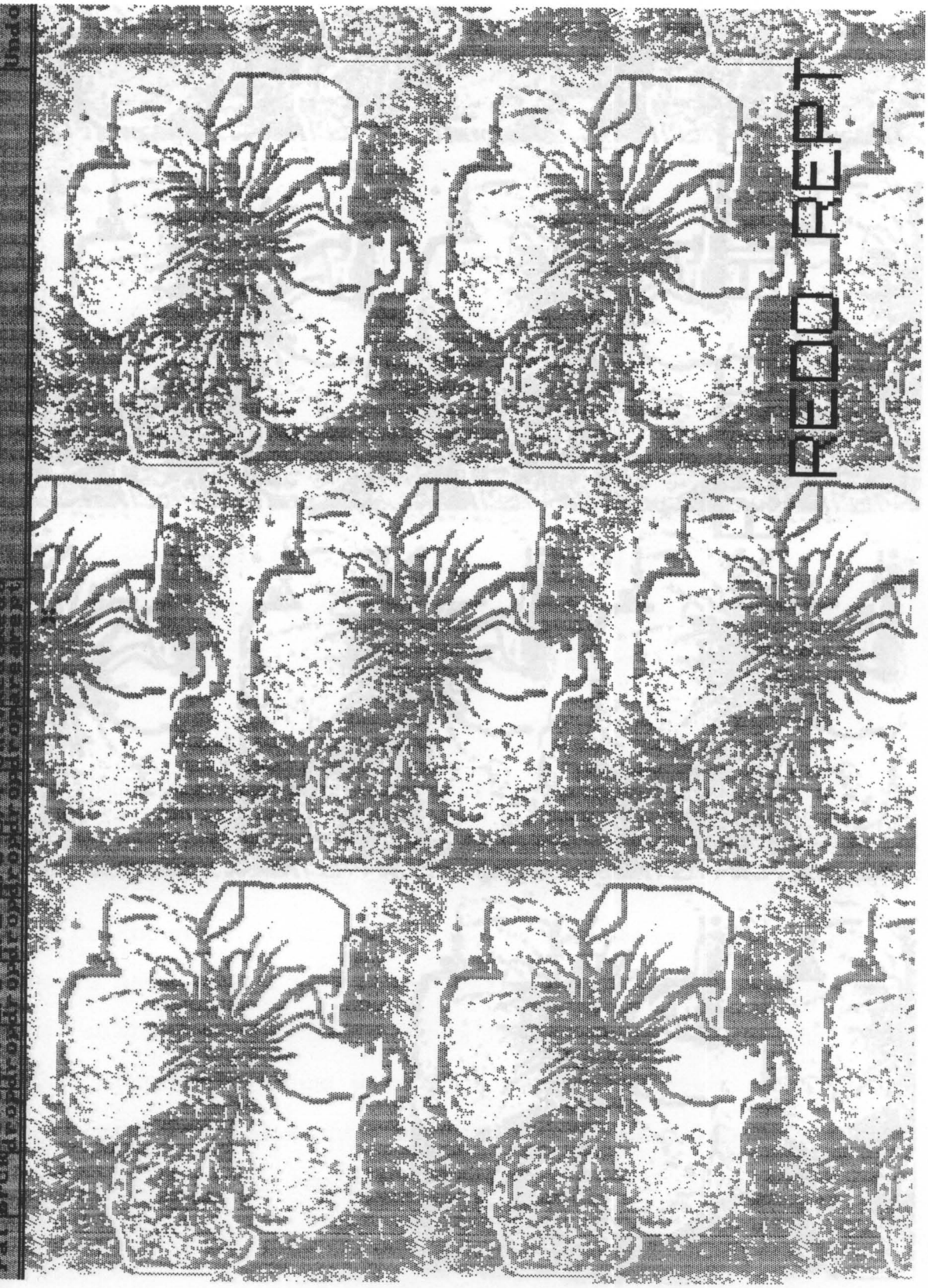


fig. 6.10

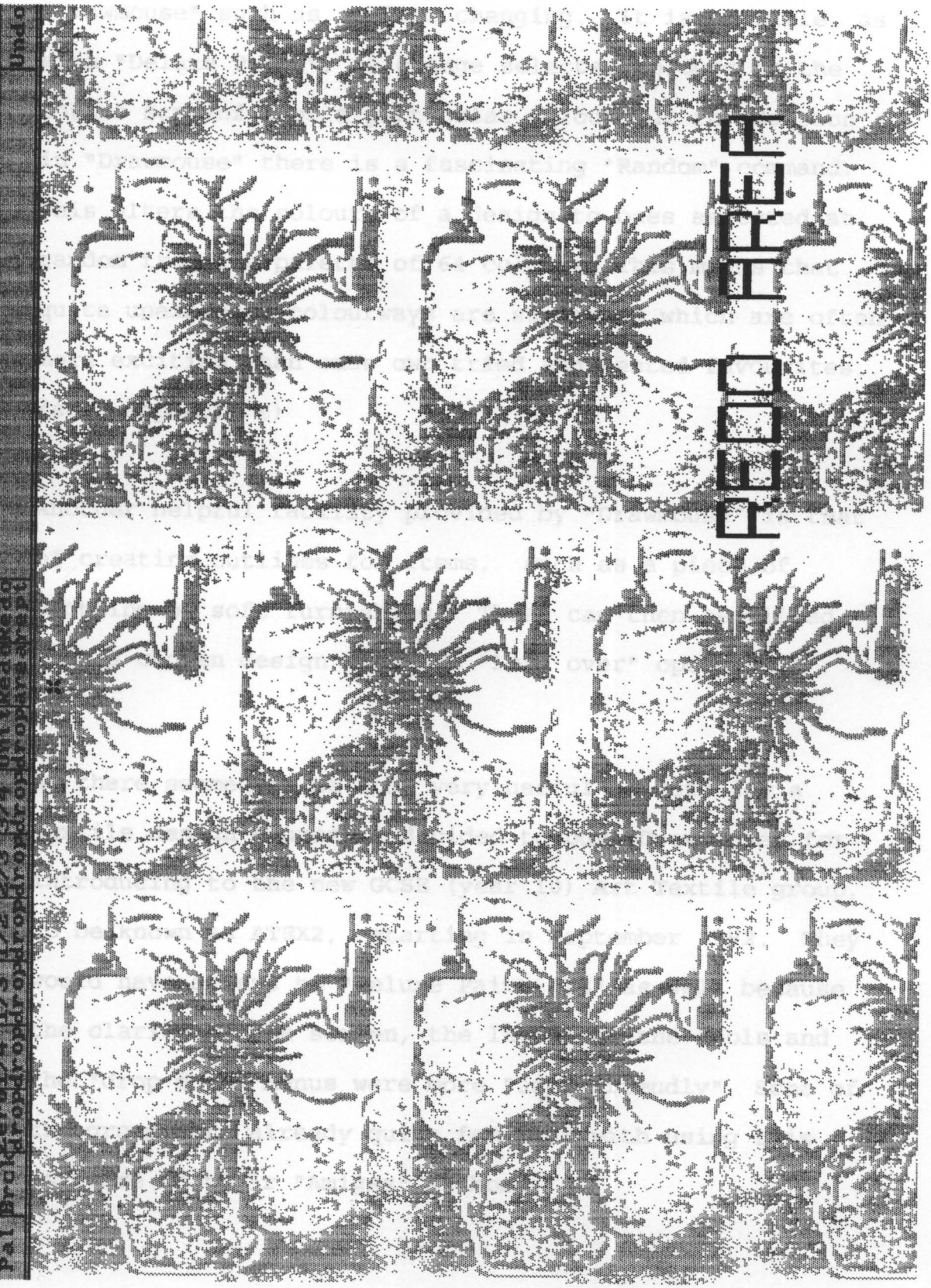

Undo
Pal Brush Stencil Page Anim Effects Grab Anim Read Write
Floodfromto Floodfromtopolygon Floodfromto Floodfromtopolygon Floodfromto Floodfromtopolygon

fig. 6.11

There are other interesting developments possible with "Drawmouse" such as colour changing. It is possible, as with "Deluxe Paint", to change selected colours or the entire screenful of a particular colour but in addition in "Drawmouse" there is a fascinating "Random" command. This alters the colours of a design to ones selected at random from the palette of 64 colours. This means that quite unexpected colourways are suggested which are often more exciting than ones own tried and tested favourites. (see appendix 6)

Another helpful facility provided by "Drawmouse" is that of creating outlines for items, such as a piece of clothing or soft furnishing. These can then be filled with a chosen design with the "Load over" option.

As there seemed to be some very useful aspects for a textile design course, I decided to buy "Drawmouse" for introducing to the new GCSE (year 10) Art Textile group, to be known as ATEX2, starting in September 1992. They would have access to "Deluxe Paint IIE" as well because the clarity of the screen, the layout of the tools and the "drop-down" menus were more "user friendly". Some of the group were already quite familiar with using this software on their "Amigas" at home.

PUPIL B'S GCSE ART TEXTILE WORK.

1.Screen printing assignment.
2.Aquarium assignment.
3.Batik assignment.

1.

fig. 6.12

6.2.1 Design work with ATEX2 and "Drawmouse".

With this new and inexperienced group I had decided to begin with an introductory project which provided opportunities for all to become familiar with some very basic textile processes. They made use of simple paper stencils and sponging and spraying as well as screen printing. Designs were developed from observation drawings and photographs, some of which were made on a visit to an aquarium.

An example of one pupil's Aquarium assignment, showing her design sheet and final printed panel, makes an interesting comparison with her later screen printing assignment which, in addition to using traditional methods, used the computer as a design tool. The use of the computer made possible greater experimentation and development. (see fig. 6.12)

Once the Aquarium project was nearly completed I began to introduce the pupils to using the computer with "Drawmouse" so that they could become comfortable with its drawing facilities. All the pupils had their own computer disk as this seemed to provide a number of advantages. If designs had been saved on the hard disk this would have taken up a great deal of memory and in addition other pupils using the computer might alter the designs. Images saved on floppy disk avoided these

problems. The system also made it possible for me to print out pupil's designs at home after I had bought a better colour printer.

As there was no printer driver from "Drawmouse" for any of our available printers, the process of achieving a printout was rather tedious and the pupils usually required help with this. The system used was to save "Drawmouse" designs as PCX files on disk. These were printed out through "Windows Paintbrush" using either the school Canon printer or my Hewlett Packard.

Meanwhile, the pupils were also developing drawings in the traditional method for the screen printing project. These were to be "scanned in" on the office computer and transferred to their disks. The decision to use the scanner was made because drawing directly onto the computer screen using a mouse was awkward.

Although some programmes such as "Paintbrush 5", have tools that simulate the effects of pencil, crayon, paintbrush and even pastel, the mouse feels cumbersome as a drawing tool in comparison with the real tools. Once drawings have been scanned it is then possible to alter these pixel by pixel and to add, subtract and repeat, textures, colours, straight lines and geometric shapes relatively easily. What is not easy is sensitive, freehand drawing.

Sh[illegible] – Scanned image of "insect"

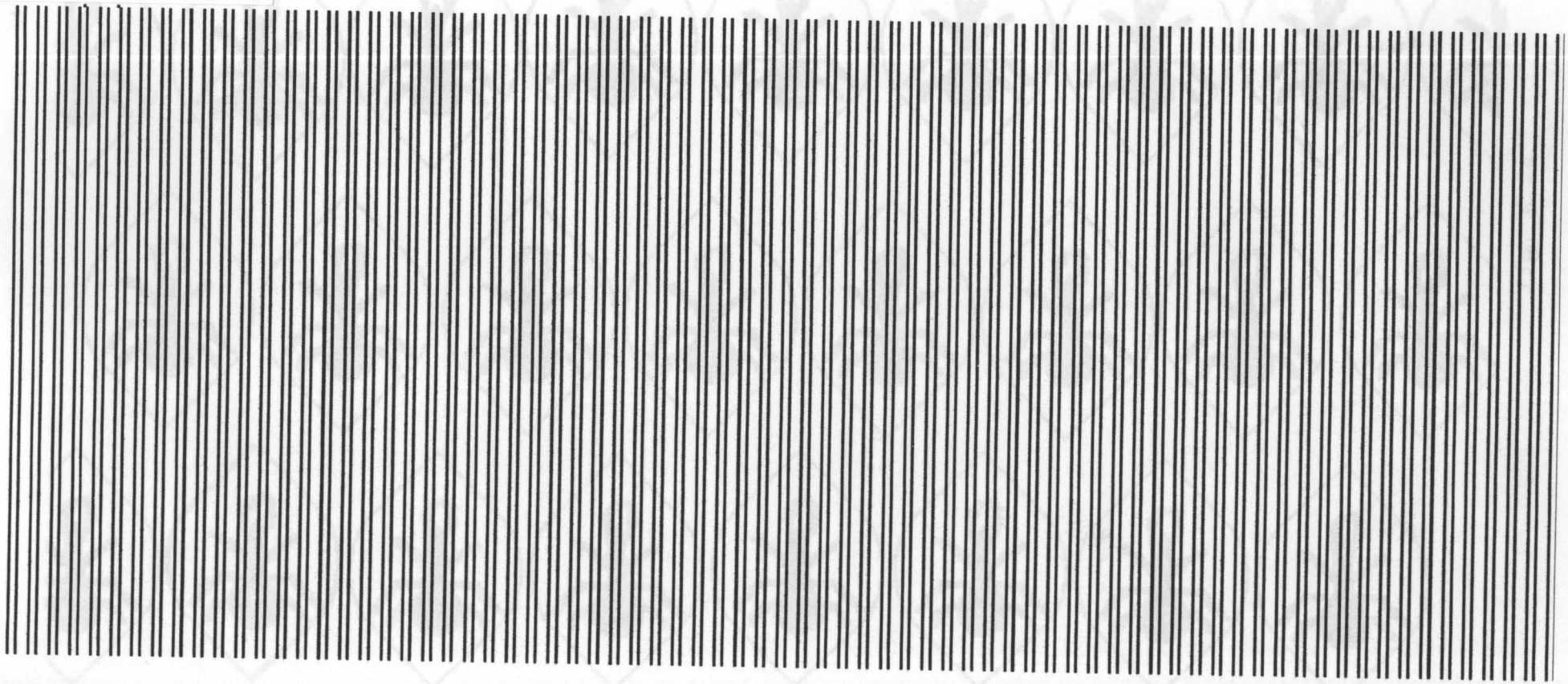


Fig. 6.13

'y' = "insect" design with some development.

fig. 6.14

We had problems initially with the scanning because the images were saved as TIFF files which neither "Deluxe Paint" nor "Drawmouse" could recognise. They do recognise imported images saved as PCX files. The scanner was a Hewlett Packard Scanjet Plus; a desktop, flatbed scanner.

The idea was that the pupils could then work on these black on white outline images and also experiment with repeats and outline fills. The main drawback to this was that when the scanned images were viewed in either of the Art department programmes there were many gaps which had to be "repaired" pixel by pixel.(see fig. 6.13) However, I showed the group how to use the magnifying facility in "Deluxe Paint IIE" which made it easier to add the necessary pixels. Figure 6.14 shows the improvements made to the scanned image "insect" which has then been used as a "brush" to create a repeated design.

I was amazed at the pupils' patience and willingness to spend hours doing this but I was disappointed that they should need to waste so much time. If the Art department could have afforded to buy a scanner to use with our system perhaps the pupils would have been able to achieve more satisfactory images. There was no way for the school secretary who scanned the images for us, to know how to set the contrast and brightness settings to achieve clear images without first putting them into the art programme.

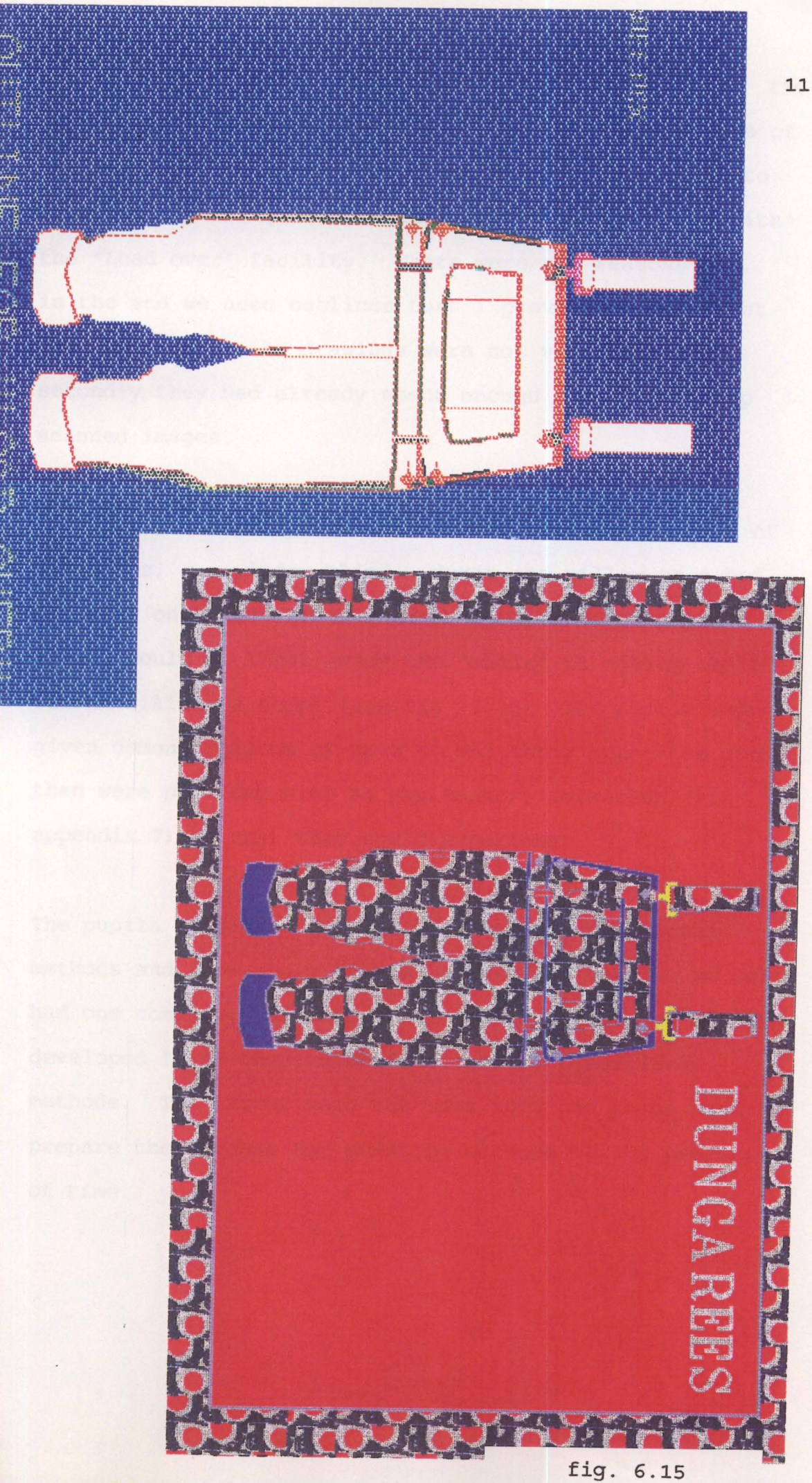


fig. 6.15

I had also planned for the pupils own outline drawings of the items for which they were designing their prints to be saved on "Drawmouse" so that these could be used with the "Load over" facility. There were two reasons why, in the end we used outlines that I provided. The first was that the pupils drawings were not very good and secondly they had already spent enough time tidying up scanned images.

Instead, I drew images of a T-shirt, waistcoat, pair of dungarees, a window blind, duvet and pillow on a bed, directly onto the screen and saved these so that the pupils could at least enjoy the "magic" of seeing their design filling a shape.(see fig. 6.15) The pupils were given demonstrations of this to wet their appetites and then were provided with an explanatory worksheet (see appendix 7) so that they could experiment.

The pupils developed designs both by the traditional methods and from their scanned images but because we only had one computer available the computer generated designs developed later than those developed by traditional methods. The latter were the ones that had to be used to prepare the screens for printing because of the pressure of time.

Screen printing using a photographically developed screen

fig. 6.16

If the pupils could have created their designs on the computer sooner, we would probably still have had to enlarge these on the photocopier as the printouts are limited to A4 paper. This however, is neither time consuming nor difficult.

The photocopier could also have been used very easily to make transparencies of the enlarged designs. These would then have been laid, in the darkroom, onto the prepared light sensitive screens and exposed to mercury vapour light. The light hardens the unshielded coating but the area blocked by the design remains soft so that it may be washed away. Subsequently when printing, the dye is passed through the screen in the areas where there is no coating. Figure 6.16 shows a pupil printing through a screen developed in this way.

Apart from the main purpose of developing repeating patterns for screen printing which was only partially achieved, the computer was used as a design tool by individual pupils to try out colour ideas for use in weaving and tie and dye assignments, and to "stretch" a motif to make it fit a design for a silk painted scarf.

6.3 IMPROVING OUR BASIC I.T. USAGE.

After the initial work with the two Art Textile pilot groups it became clear that there were positive advantages to using computers as one of the tools. One of the least able and most disorganised members of the second group even came into school early one morning during the holidays, when she knew that I would be there, specifically to work on her design on the computer! Obviously the computer had been a positive motivator for her. However, there were a number of areas which ideally, I would like to have improved.

Whilst the software packages seemed to provide us with lots of scope if we had but the time to become fully conversant with all their attributes, one of the main problems seemed to be that of obtaining good quality printouts. Another problem seemed to be that of making use of, and developing the pupils own drawing skills, and also encouraging them to see that they could develop designs from other sources, with the help of the computer.

6.3.1 Printouts and other methods of producing copies of designs

There was a noticeable increase in pupils' enthusiasm after we changed from a black and white to a colour printer as they would stay on through "break" or lunch time to wait for their work to print out. It was worthwhile re-printing some of their designs on my Hewlett Packard printer at home as this produced colours more like the vividness of the image on the VDU. The representation of colours was not exact but this seems to be a problem that professional design companies such as "Courtauld's Leisurewear" also have to contend with to some extent, even though they are able to afford much more expensive printers. The printouts from these better printers have the disadvantage of being much more expensive to produce. The Textile department at Liverpool John Moore's University charges students £1 per colour printout although they estimate that the real cost is nearer £3.

The Canon uses colour cartridges which cost £17.50 but these last for many months. It is impossible to say how long as no one knew how old the cartridge was when we acquired the printer second hand and although this has been renewed, the new cartridge is still producing adequate prints. Obviously the quantity and density of printing is also relevant and so far the computer has

mostly been used to generate designs for screen printing assignments. Printouts are onto offcut rolls of paper acquired free.

My Hewlett Packard has separate colour and black cartridges. The mail order price for twin refill packs of black is £19.95 and a pack of three colour cartridges costs £69.95. Both these prices include VAT, packing and postage. The paper used is seldom that which is recommended but is usually 80 gram copy paper bought locally at about £3.50 per ream. It is possible to buy this cheaper by mail order. As the printer is used by other members of my family I have not been able calculate an accurate cost per print. Perhaps, if I knew the true cost I would be less prepared to print work for my pupils!

Another method of producing copies of the work was to photograph the screen.(see fig. 6.17) Although we tried this the results would be, for most purposes, too small to work from. It is a method advocated and used by Valerie Campbell Harding, a well known enthusiast and lecturer on using computers particularly in embroidery design. She recommends using a SLR camera on a tripod and Fuji Reala colour print film as its warmer colours counteract the cold quality of colours on screen. As it is 100 ASA the grain is fine enough for detail to be shown.

GCSE pupils at work on the Art room computer and a photograph of the design on screen.

Fig. 6.17

6.3.2 Methods of "inputting" design ideas to a computer.

Although it is possible to draw with the mouse and create designs directly onto the screen, it is not as sensitive or as easy to control as a pencil. It is possible to use a graphics tablet and a pen or a stylus which was the method demonstrated to me by "Concept II" who produce the "ORMUS" software. I also saw these at Edge Hill College of Higher Education's Art department and being used by the textile students at John Moore's University. Unfortunately, I was not able to try these for myself and neither were we able to invest in them for use in school.

We had been able to make use of the school's office black and white, flat-bed scanner but, as has already been explained, the quality left a lot to be desired. Since then the school has bought a new computer, an Elonex 486, to which the scanner is now connected. The scanning software also having been improved, it is now possible for the secretary to view the enlarged image immediately it has been scanned. Any problems with the image can quickly be seen and the brightness or contrast settings adjusted.

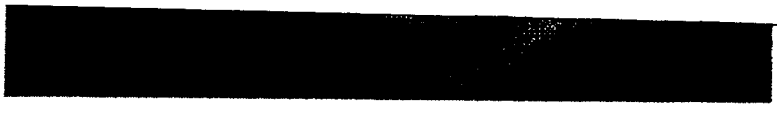
- "butterfly" drawing showing the improved quality of scanning.

fig.6·18

The second group of Art Textile pupils were taken down and given a demonstration of the scanner's improved capabilities. No longer do the scanned images require hours of work adding pixels. It is interesting to compare these results, (see fig. 6.18) with the poor quality of the original scanned images. (see fig. 6.13) A number of the pupils have made use of this facility, often suggesting this themselves.

The scanner is only a black and white one but this seems quite adequate for our purposes especially as there is the choice of scanning in line, tonal or photographic images. We had a little difficulty getting the scale of the scanned images right. Initially our images were much too big for the computer to cope with. We have since found that a drawing or illustration to be scanned should be no larger than about A5 and that it needs to be scanned in at about 5% scale.

It is possible to use hand held scanners which are cheaper. I have bought a Logitech Scanman 32 for £104 which produces clear images but it is quite difficult to roll the scanner accurately over an image. Anything wider than 4.0 inches or higher than 14.0 inches has to be "stitched" together. I have also seen printouts from images input by a flat-bed combined colour scanner/printer/photocopier. They were attractive but the equipment was very expensive, costing about £4000.



Printouts from video digitised image

fig. 6.19

Although I had read that a Canon Ion camera had a number of facilities which seemed useful, such as the possibility of taking photographs and inputting these to the computer, on further investigation I discovered that the price of the camera and the necessary interfaces would have cost over £1000. I also had the opportunity of seeing some results from a video digitiser. (see fig. 6.19) These were a little fuzzy but were in colour so perhaps this system might prove to be more versatile in its image "grabbing". Sadly we have not had the opportunity to acquire this system either, although video digitisers are evidently being used by textile departments in Art Colleges.

There are clearly other peripherals that are available now, at a price, which could be very useful to a GCSE Art Textile design course, just as there are other software packages and faster computers. Even if we could have afforded the peripherals already mentioned for the Art department, the world of computers would have spun on to ever more exciting and expensive discoveries. However, a start has been made.

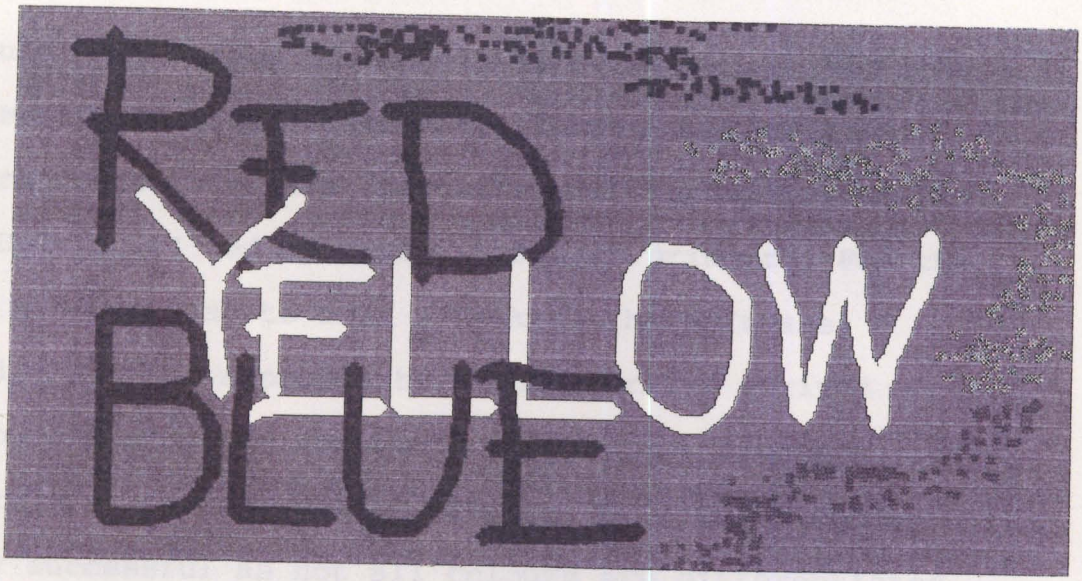
6.4 EVALUATING AND TESTING.

6.4.1 What has not been achieved.

It has not been possible to achieve all that was hoped during this pilot for a variety of reasons, the main being the unexpected break in the teaching of the principal pilot group "ATEX2" because of my early retirement. This meant that no time was spent on using some of the aids to screen development such as the facility for separating designs into individual colours for the preparation of stencils.

The "colour separation" facility command displays the design in a variety of ways; the sixteen pure colours can be shown separately or the four colours associated with colour printing; yellow, magenta, cyan and black can be isolated. (see fig. 6.20) Having done this the next step would be to convert each separation to black and then print each out onto individual transparencies. These can then be used directly as light resists for developing photosensitive screens thus avoiding tediously preparing screens by hand. Photographically prepared screens allow for the use of more detailed and delicate designs than is possible with other methods, in particular paper stencils.

Red colour separation.



Magenta colour separation.

fig. 6.20

"Drawmouse" can also be used to calculate the percentage of each colour being used in a design which should make it easier estimating the amounts of dye required in each colour. Unfortunately, in the event none of these useful facilities were used with "ATEX2" because the screens had to be developed from the manually prepared designs; the computer developed designs were completed later thanks to the inadequate supply of computers.

The main problem was the lack of hardware. Although there were only ten pupils in "ATEX2" there were lengthy delays caused by only having one computer. The earlier promise of a bookable room full of PCs only being installed two years later which was after I had left. The poor quality of the early scanned images caused further delays in the development of designs and the quality of printer available in the Art department was also rather frustrating.

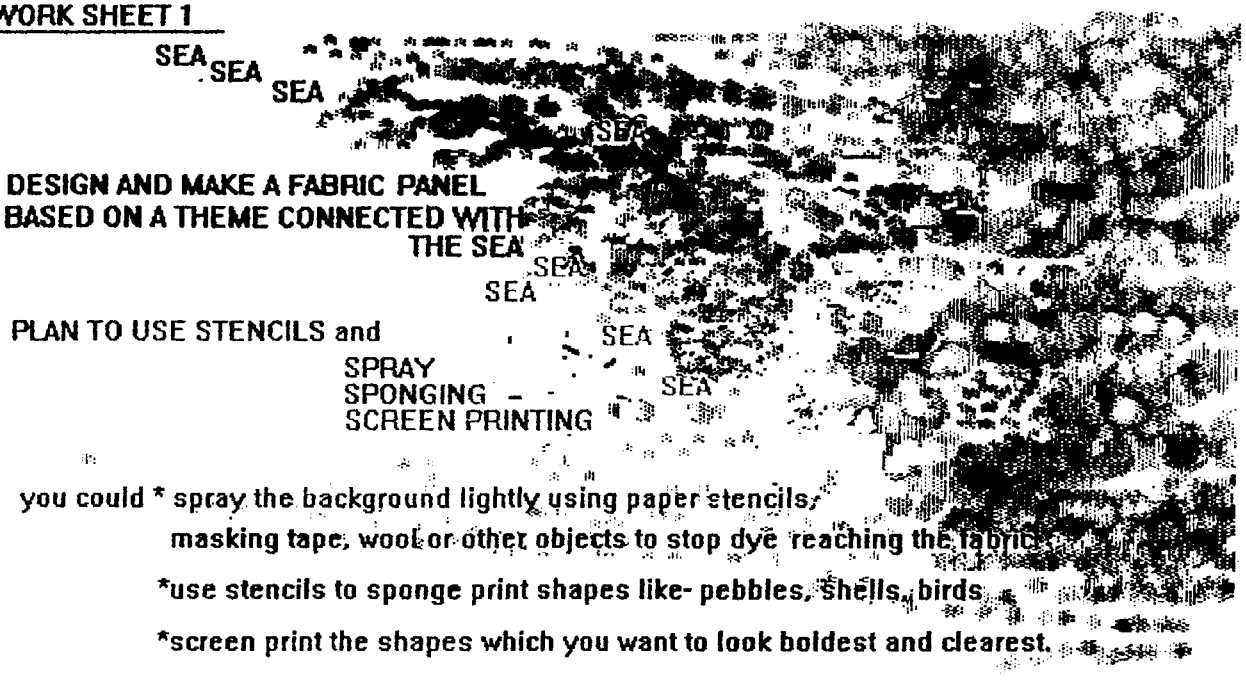
It would have helped the pupils if printing out had been more straightforward. Recently, I have been able to acquire printer drivers for using with "Deluxe Paint IIE" and "Drawmouse" and my Hewlett Packard printer. For the first I simply had to send a disk to the software supplier and the appropriate printer driver arrived by return of post. The "Drawmouse" driver is bought for £20 as part of a package called "Printpic". This is only partly successful as not all colours are differentiated

and it is not possible to print out directly from "Drawmouse". Instead, one has to save the design, exit and then re-load the design in "Printpic". Only after considerable experimentation with the settings available did I achieve prints of an appropriate size.

Ideally, for computers to be useful as design tools in a GCSE Art Textile course it would be necessary for each pupil to have a computer to work on once the initial drawings have been made and scanned. At this stage and when new processes are being introduced it would be helpful if there was a system of booking the use of sufficient computers with appropriate software for the whole group to use. Later, a stand-alone machine in the Art department would probably be adequate provision for pupils to avail themselves of as and when necessary.

The quality of the scanned images would need to be of a better quality than was achieved on our early scannings. It would be best if the Art department could afford to buy their own scanner so that it was not only readily available but so that the quality of image could be immediately checked. Acceptable results can be achieved with a black and white scanner such as the Hewlett Packard Scanjet Plus. The even cheaper Logitech "ScanMan 32" also produces quite clear images but it is more difficult to scan images wider than 4" as these have to be "stitched" together.

WORK SHEET 1



DESIGN AND MAKE A FABRIC PANEL BASED ON A THEME CONNECTED WITH THE SEA

PLAN TO USE STENCILS and
SPRAY
SPONGING
SCREEN PRINTING

you could * spray the background lightly using paper stencils, masking tape, wool or other objects to stop dye reaching the fabric.

*use stencils to sponge print shapes like- pebbles, shells, birds.

*screen print the shapes which you want to look boldest and clearest.

PREPARE - STENCILS

FABRIC FOR PANEL-choose colour and size

DYES -for spraying use fabric dyes from bottom shelf under squeegees. Dilute these with water.
-for sponging & printing use dyes on trolley.

Test your dye colours on spare fabric the same as your background.

BUILD UP YOUR DESIGN STEP BY STEP - Let each stage dry before doing the next one.

REVIEW AND IF NECESSARY MODIFY YOUR IDEAS AS YOU GO ALONG.

FINISHED PANEL - Evaluate this before mounting. Would it be improved if you added more shapes or colours? Discuss this with your neighbour and Mrs Reid as there are other techniques that you could add.

MOUNT PREPARATION WORK - Drawings, cuttings (a few), experiments. Lay all this out on your background paper and consider the layout with Mrs. Reid before sticking down carefully.

MOUNT FABRIC PANEL.

fig. 6.21

Even better results might be achieved by using a CD-ROM and photocard so that the pupils could make use of their own photographic images as sources for design development. For development of designs, a graphics pad and a stylus would provide a more sensitive and responsive tool than a mouse, to work with on the computer.

The use of work sheets to introduce assignments had been a tradition in the Art department.(see fig. 6.21) Their purpose was to guide the pupils through the basic steps which they were expected to take while suggesting other areas open to them to explore. It was not unknown for the staff to spend considerable time devising these, if possible, making them look visually stimulating, only to find that the pupils failed to refer to them after the initial introduction.

Although worksheets were used in some instances with "ATEX1" and "ATEX2", to provide guidance in this new area of computer use if I was busy helping other pupils, it was more likely that the pupils would refer to me or each other. Little use appeared to be made of guidance sheets. Perhaps they were too complex for use after just one lesson's demonstration. They would have been more use as support if there had been sufficient computers for the pupils to have immediate practical experience on them whenever a new process was introduced.

6.4.2 Analysis of the questionnaires given to the pupils on the pilot.

There were two GCSE Art Textile groups who had access to a computer during their course. The first group, ATEX1, was already in year 11 in 1992 when the main pilot group started their course. It has seemed relevant to consider both groups as they had many similarities.

Both groups were small and of very mixed ability. ATEX1 had, for the majority of the time, twelve members of whom two were boys. This was briefly augmented by one for a few weeks but this male pupil did not use the computer and soon returned to the special school from which he had come. The second group, called ATEX2, had ten pupils of whom, once again, two were boys.

ATEX1 were first asked to complete a questionnaire on their use of computers in September 1992, at the beginning of year 11 of their GCSE Textile course. They completed a second questionnaire in May 1993 as they completed the course. ATEX2 completed their first questionnaire in September 1992, as they began their GCSE Textile course in Year 10. They completed a second questionnaire in July 1993 as I did not know that I would be teaching them again after my retirement. As I did return to teach them after a break, they completed

another questionnaire at the end of their GCSE course in May 1994. The questionnaires and the detailed analysis of them is to be found in appendix 8.

Most pupils in ATEX1 were surprised to be given the possibility of using a computer on a textile course whereas only three of ATEX2 were, perhaps because they had already seen the computer being used in the Art room. Fewer than half of each group had access to a computer at home but when questioned about their experience of computers prior to starting the textile course all pupils, except one boy in ATEX1, said that they had some previous experience. For the pupils in ATEX1 this was largely connected with playing games. Three of this group had word processing experience compared with more than half of ATEX2 of whom all but one also claimed experience with graphics packages. Conversely fewer than half of ATEX2 claimed that they had played games on computers.

After using the computer for a year, as part of the GCSE Art Textile course, the pupils were again given questionnaires to fill in. All had used the computer and in each group there was only one pupil who had not liked this experience. These were both girls.

The reasons given for finding the computer helpful in the design of textiles were pertinent. ATEX1 pupils made the following different observations about using the computer:

"quicker for drawing"
"quicker for designing"
"can change colours and designs easily"
"good for creating repeat patterns"
"good for making different examples for design sheets"
"good for colours for design sheets"
and
"Computer is much quicker, can produce many designs quickly, gives precise lines and good graphics."

This last comment was made by Paul, probably the most able and intelligent member of the group. He was certainly the most hardworking and the one most interested in using the computer as a design tool which he did in a variety of ways. (see figs. 6.6, 6.7 & appendix 5) This pupil achieved a grade A in GCSE Art Textiles and grades A to C in nine other subjects which is well above average achievement for pupils in Secondary Modern Schools.

The pupils in ATEX2 made some similar observations about the positive aspects of using the computer with these variations:

"you can save your drawing and print it out and it will always be the same"
"you can experiment differently and try different colours"
"saves drawings and different colour schemes"
"It gives you a better idea of what the design is before you make it"
"doing repeat patterns"
"getting pictures from DPaint"

This last comment could relate to the possibility of taking designs made on "Deluxe paint" into "Drawmouse" for using in repeat patterning or with the load over facility. As the pupil who made the comment was very familiar with "Deluxe Paint" he knew about the ready made pictures such as the head of Tutankamun already installed so he might have been referring to these. He did not, however, use any of these images in his design work.

The disadvantages that the pupils had found in using the computer were just as important. These were as follows for ATEX1:

"printer was slow"

"only one computer"

"mouse hard to draw accurately with"

"not enough time on computer"

"when we didn't have a colour printer"

"may loose designs"

One pupil in this group said there were no disadvantages.

ATEX2 made the following observations:

"hardly get to use the computer"

"don't know/ not enough time"

"the mouse didn't work right"

"the colours do not come out the same on the printer as they are on the computer"

"if you press the wrong key you could wipe the whole design"

"not enough computers in the room"

The comment about the mouse should probably be interpreted as that the mouse was difficult to control. Unlike the computer which had to have a replacement hard disc, at no time was the mouse out of order.

The second group were asked which programmes they found most useful in Art Textiles as they had more opportunity than ATEX1 to use both "Deluxe Paint" and "Drawmouse". Their responses were mixed. Two pupils preferred "Drawmouse", one giving the reason;

> "Drawmouse" because you can put your design on it and see what it is like"

Another pupil preferred "Deluxe Paint" saying that its graphics were easier to use. There was one pupil who said that he preferred using "Drawmouse" for repeats and "Arts and Letters" for "picture ideas". "Arts and Letters" has a "Clip Art" facility to which some pupils have been introduced in their Design and Technology lessons. All the other pupils said that they liked using both "Deluxe Paint" and "Drawmouse" as "there were several things to experiment with."

There were no suggestions of other software packages that the pupils would like to use in textile design, no doubt because they had no other experience on which to call in this field. However, their responses to the available programmes seemed relevant and positive and concurred with my experiences of using the computer in textile design.

There do remain some doubts as to how much credence can be given to the findings from these questionnaires. In a questionnaire which ATEX2 were given at the end of their course, (appendix 8, table 8.5) the response to the question;

> "When you started the GCSE Textile course did you expect to use the computer for designing?"

was almost exactly the opposite of what they had said in answer to the same sort of question in the first questionnaire that they had completed. The two boys said that they had expected to use computers and all the girls said that they had not expected to.

Another indication that the findings are not entirely reliable is that ATEX2, when asked in question 10 of their third questionnaire, (appendix 8, table 8.5) to tick the "Drawmouse" features that they had used for designing, none ticked "load over". This is the facility of the programme which allows a design to "fill" an outline shape. Interestingly, later in question 14, five out of seven indicated that a feature that they found helpful in designing for textiles was:

> "I can see what my design would look like on a waistcoat etc."

There was only one more popular choice which was:

"I can change the colour schemes quickly".

The reason for this discrepancy would most probably indicate that the pupils had not remembered to what facility the term "load over" referred.

A further possible distortion that can be created by the style of questions posed is indicated in question 15. Here three possible disadvantages were given, two of which had been mentioned by the pupils themselves in previous questionnaires. The pupils were also invited to write in any other disadvantages. While all three suggested disadvantages were ticked by over half the sample only two other disadvantages were written in. These were that designing on computers was "time consuming" and sadly, "confusing". Nobody mentioned their most frequently made previous complaint which was that there were simply not enough computers. This was, however, a point made in response to the last question which asked what would most help them to do more designing for textiles. More time was another.

Although seven out of nine respondents said that they thought that the computer helped them to develop designs for textiles, when asked in question 17 whether they would like to do more designing for textiles on the computer, only four out of nine said that they would.

This disappointing response may be interpreted in a number of different ways.

6.4.3 Summary of questionnaire findings.

At face value it would seem that the pupils had not enjoyed using the computer as part of the GCSE Art Textile course and this might very well be true. This unfortunate outcome might be justified in two ways; firstly, due to my retirement the pupils had not had the same encouragement to use computers or to design for screen printing for several months. Although I returned to teach the class after four months, there was considerable pressure to complete work begun by another teacher for which the use of computers would at that stage, have been inappropriate. The momentum for using computers had to some extent by then been dissipated although once the pupils had been shown the better results now possible with the scanner, this was seized on as a helpful facility by all except two.

Another reason for the pupils' apparent lack of enthusiasm for using the computer for "more designing for textiles" could perhaps be that the questionnaire was being completed on the very last day of their course. The pupils were looking forward to leaving school altogether and were not contemplating doing any further lessons!

6.5 SUMMARY

The first pilot group ATEX1, mainly had access to "Deluxe Paint II" software. This was very "user friendly" as a basic paint programme but lacked some of the advantages for textile design of "Drawmouse", the software additionally available to ATEX2, the second pilot group.

Although both these packages gave indications of providing useful additions to the traditional tools of textile designing, the pilot groups were hampered by the quality and quantity of the hardware available to them.

The case for the use of computers as a tool for GCSE Art Textiles pupils would not seem to be entirely supported by the responses of the questionnaires. However, the break in the course caused by my early retirement and the pupils' own frustrations at the lack of computers and adequate printers must be borne in mind, coupled with the thoughtful comments that they made in the questionnaires about the positive aspects of using computers for designing. Perhaps most importantly, there is evidence that using computers can be a motivator for the less able and provide extra stimulation for the most able.

CHAPTER 7

RECOMMENDATIONS AND CONCLUSIONS

7.1 RECOMMENDATIONS FOR THE USE OF I.T. IN THE ART TEXTILES COURSE AT SOUTH WIRRAL HIGH SCHOOL.

Although there were limitations to what was achieved with the pilot study, there were some indications of how such a course might be developed in the future. In addition, since first beginning this investigation into the viability of the use of computers in a GCSE Art Textile course, many more possibilities have become apparent as I have slowly gained knowledge and experience.

As the pupils who opt for GCSE Art Textiles at South Wirral High School have had, in the main, very little experience of art textile techniques, it seems preferable to introduce such a practical course with an initial assignment that gives the pupils a general introduction to a range of simple textile techniques. The main focus would be on the need for developing their own drawings and using them in preparing simple stencils. These can be used in a variety of ways; spraying and sponging through and around; crayoning the edges and then smudging off onto fabric. It is also possible to use stencils for drawing round to prepare designs for techniques like

batik or quilting but at this stage the additional complication of creating interlocking repeating patterns would be avoided.

The early development of stencils could be combined with use of the computer to create designs. These can be printed out a number of times and then different sections cut out of each of the printouts to create stencils. (see fig. 7.1) This is one of the first techniques shown by tutors from the Computer Textile Design Group, when demonstrating the use of the computer in textile design. They make use of simple shapes such as the rectangle maker on "Deluxe Paint 11E", to build up a design.

After this introduction, the more complex idea of using stencils for repeated patterns and screen printing, could be introduced through the use of scanned drawings or photographic images on CD-ROM. Pattern repeats would be developed with the help of software such as "Drawmouse". Designs could then be further developed using a graphics pad and stylus until several alternatives had been produced. These could be printed out in a number of colourways, perhaps suggesting use for different seasons or different clients, and the designs could also be shown filling different outlines using the "load over" facility on "Drawmouse".

fig. 7·1

Once the final design had been decided on, the pupil could use the colour separation facility to prepare printouts and these could be printed out directly onto transparency film suitable for the process of developing photographic screens from which the fabric may be printed. (see fig. 7.2)

One of the drawbacks to developing designs on the computer is the size limitation. If the design needs to be enlarged this can be achieved by printing out the colour separations onto ordinary copy paper and then enlarging this on the photocopier. If the enlargement is no larger than A3 then a final copy can be made using overhead projector film which makes an ideal opaque image for the photographic development of light sensitised screens. It would be possible to achieve larger images by carefully piecing several sections together.

As has been previously mentioned in chapter 6, the "Drawmouse" software also has the facility for working out the percentage of each colour used in a design. This would enable the pupils to calculate how much of each dye colour to mix and so prevent expensive wastage.

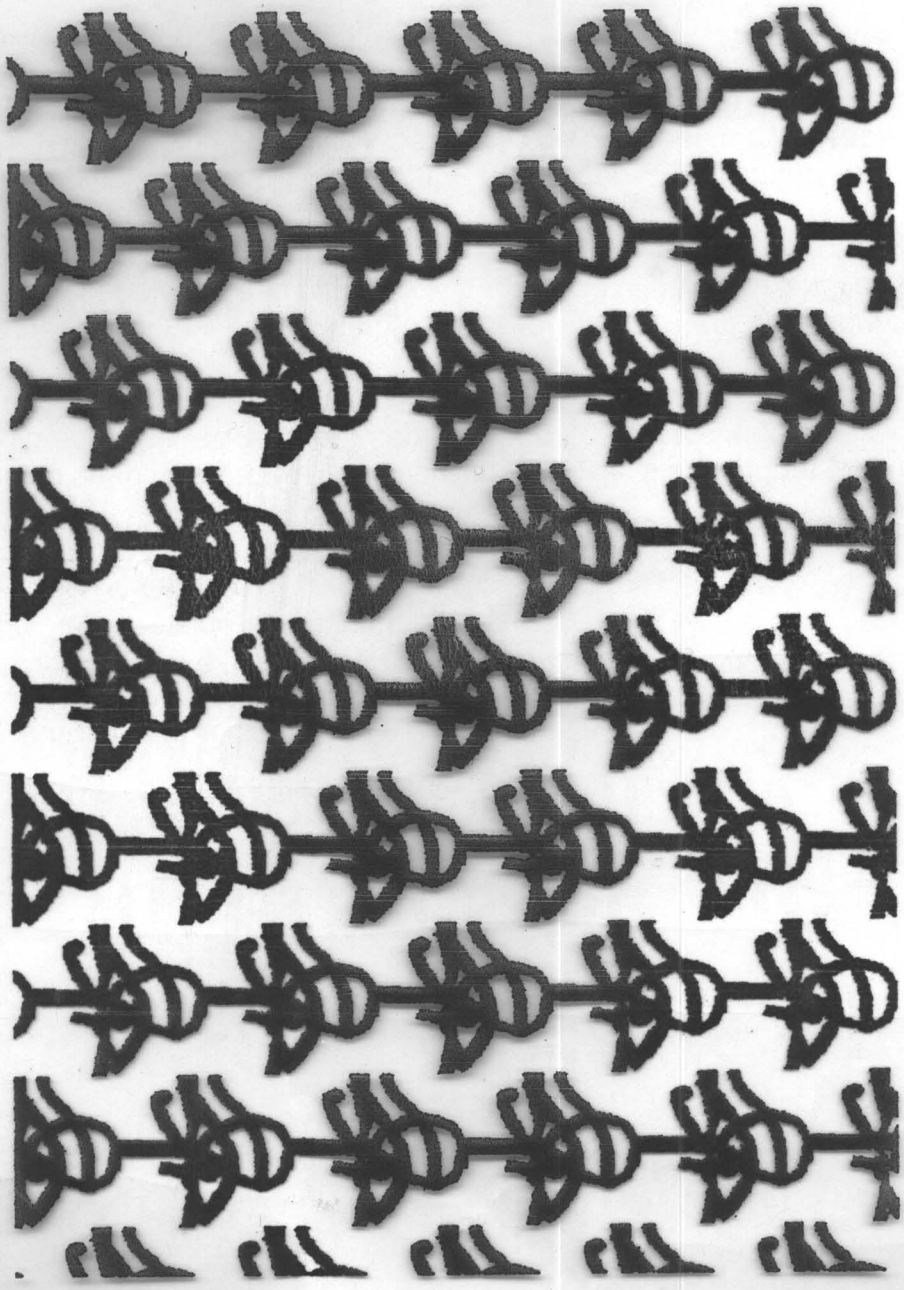


fig. 7.2

All these processes are achieved much more quickly with computer assistance than they were traditionally. The time gained should allow for more experimentation with a wider range of textile techniques than is at present possible.

The computer can be used to produce printouts with transferable inks and the designs can then be ironed onto fabric. Designs produced this way could form the basis for embroideries, quilting and appliqué. Ordinary colour printouts can be made on a variety of papers including brown and other wrapping papers, and then these can be used experimentally in combination with fabrics and fibres, metallic sprays and crayons and a variety of art and textile techniques.

It is possible to print out onto "Bondaweb" which is a fine, paper backed, glue surface normally used to stick two pieces of fabric together. Printed on, it can be ironed on and used to create a design on the surface of a fabric with delicate, interesting effect. One of the advantages of using the computer in these processes is that the speed at which printouts can be produced and their endless repeatability, gives pupils a confidence to experiment.

Apart from the previous suggestions for the use of I.T. as part of a GCSE Art Textiles course, pupils could develop ideas on the computer screen which could be translated directly into painting on fabric with paints specifically formulated for this purpose. There are other fabric paints and crayons such as "Transfer Printing Inks" and "Fabricrayons", which can be used to work with on paper printouts and then ironed onto fabric to transfer the design.

Previously in the textiles course at South Wirral High School, designs to be used in tapestry weaving have been prepared with traditional methods. Now computer printouts have been used for the same purpose with the advantage that, at the design stage a computer allows for swift changes of design, colour and even size.

An example of computer printouts being used as the design guide for a large tapestry weaving was seen at the 1994 national exhibition of the "Association of Guilds of Weavers, Spinners and Dyers" at Swansea. The design was shown in two sizes, the enlargement being used as a guide so that visitors could add to the weaving during the course of the exhibition. (see fig. 7.3)

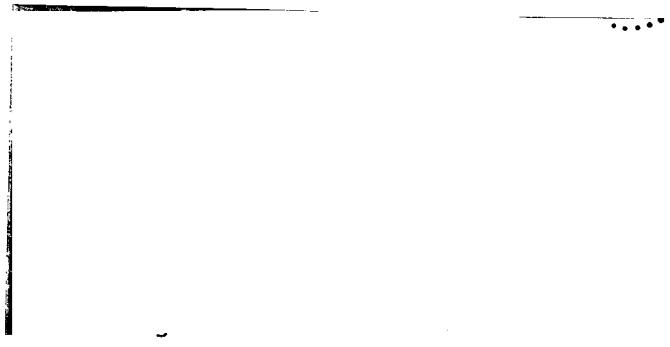


fig. 7.3

Weaving at the National Exhibition of the Association of Weavers, Spinners & Dyers, showing the use of computer printouts.

There is software on the market applicable to patchwork block design and machine knitting which would be appropriate for some school textile courses. There is other software suitable for text and image storage for ideas and designs. These are areas still to be explored but would seem to provide pupils with further extremely useful, transferable I.T. skills.

7.2 HOW THE INVESTIGATION COULD HAVE BEEN IMPROVED.

In spite of not having achieved all that I had hoped with the pilot groups and the use of the computer in their Art Textile course, there was some value in the fact that to some extent we were learning together. In some instances pupils were more knowledgeable than me as they were already familiar with "Deluxe Paint 4" on their Amigas.

However, my lack of knowledge did lead to frustrations and delays as I tried to solve problems such as achieving printouts without appropriate printer drivers. Initial uncertainties lead to time being wasted on poor quality scanned images. Progress was delayed so that many of the computer's advantages, such as preparing colour separations and then transparencies for screen making, were not used.

Now, I would be able to introduce the use of computers with greater confidence but it would have been better if, at the outset, I could have undertaken a course of appropriate tuition on using a computer, and received advice on the most suitable hardware and software. Such information did not seem to be readily available except at prices my school could not afford.

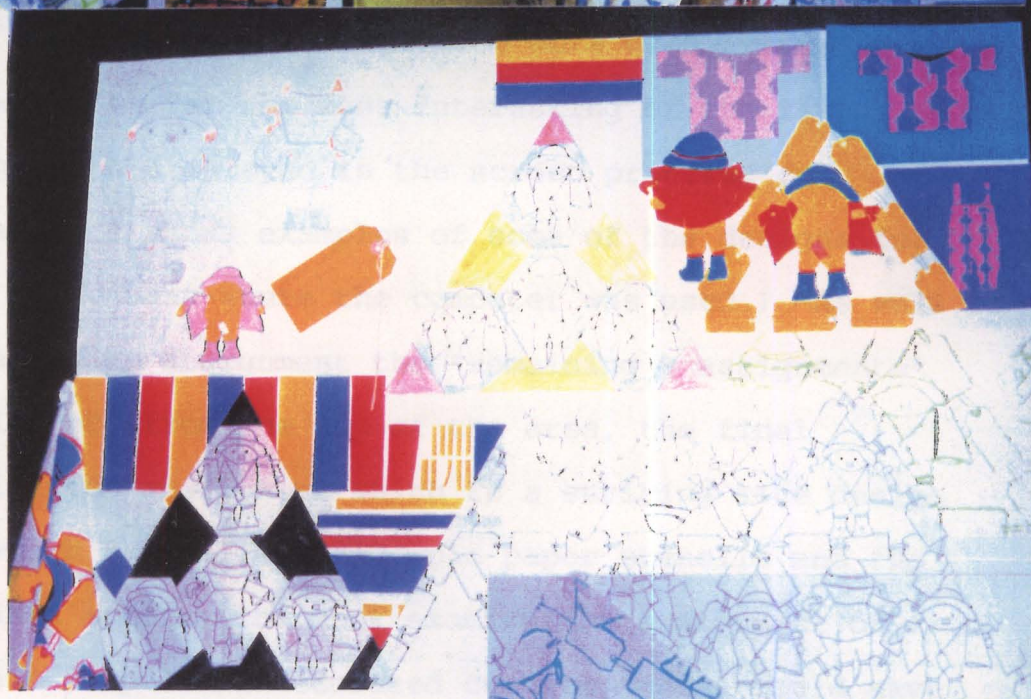
It is obvious from our experience that more than one computer is needed and ideally there should be one per pupil at some stages. In addition one requires a good colour printer, a black and white scanner and if possible a C.D. ROM with photo CD capabilities. Although not essential, the use of a graphics pad and stylus would be preferable to a mouse for use with Art packages.

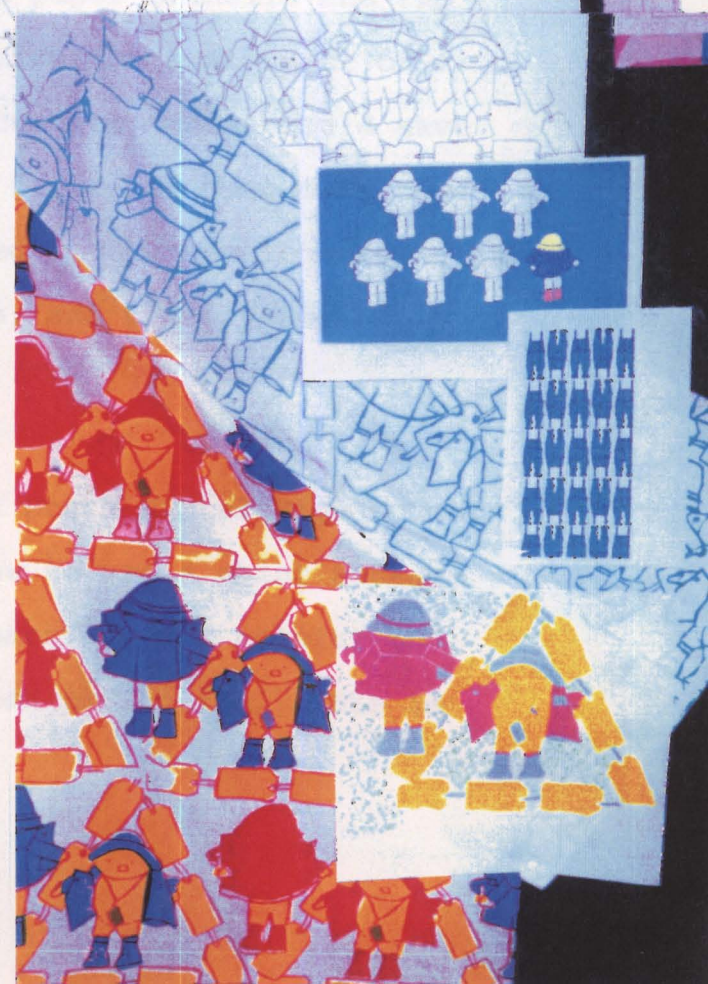
7.3 CONCLUSION

In spite of the short-comings of this pilot work, our experiences would make me feel confident in recommending that computers have a useful part to play in a GCSE Art Textile course. I would make the provisos that: training would be made available to the teacher; there would be advice given on appropriate resources; adequate funding be provided to properly equip the course.

In spite of the fact that the pilot study was inadequately resourced, it has been shown that the experience of using computers motivated both the less able pupil and higher achievers. Pupils can work at their own level and pace, often producing more results showing a greater variety and depth of understanding.

I regret that pupils were unable to use computer techniques in the pilot studies as much as I would have liked. They were encouraged to use the computer as one of the tools in their screen printing assignment. However, the computer had not been introduced for the earlier "Aquarium" assignment as during this they were concentrating on making drawings of images and using these to create stencils for use with more basic textile techniques. The computer was also not used for the batik assignment as the teacher involved was unused to using computers. When I returned as a relief teacher after four months, the batik project required completion but the second computer that we had previously managed to borrow had been returned. The pupils were soon to be involved in preparing individual assignments as part of their "mock" examination. This was almost immediately followed by preparations for the final examination assignment which meant that I had little opportunity to encourage the pupils to use the now unfamiliar computer.





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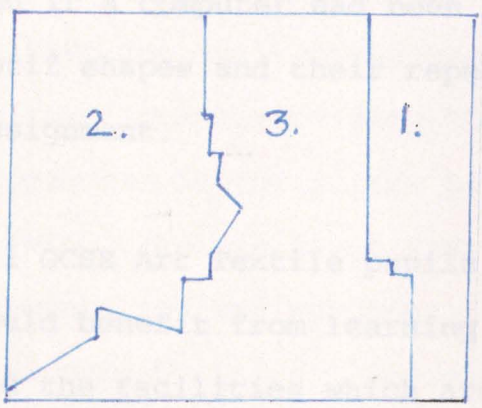


PUPIL A'S GCSE ART TEXTILE WORK.

1.Aquarium assignment.
2.Screen printing assignment.
3.Remaining 3 assignments.

fig. 7.4

It was clear from the 1994 GCSE Art Textiles exhibition of pupil work that more experimentation with designs, colour schemes and their possible uses had taken place where the computer had been used as a tool than in the assignments produced without resource to a computer. An example of this has already been shown in chapter 6 (see fig. 6.12) and may be seen even more clearly in figure 7.4 where by far the most interesting of the five assignments displayed is the screen printing one. (Appendix 9 shows examples of some of the designs for this assignment where the computer was used.) As well as the aquarium assignment the "remaining 3 assignments" consist of, from the top of the area, the final examination assignment which is a striking kite design but which has relied on simple paper stencils and two repeated motifs; the mock examination assignment of a "sweet" shaped and decorated cushion, which could have been made more interesting if there had been more time and if a computer had been used in the development of the motif shapes and their repeats; and finally the batik assignment.

All GCSE Art Textile pupils at South Wirral High School would benefit from learning how to use a paint package and the facilities which are particularly helpful to repeat pattern making and screen production. This is

partly because the department is well equipped for, and has a strong tradition of screen printing.
An equally important reason is to provide another avenue for pupils to gain confidence with using computers. Even the slimmed down document "Art in the National Curriculum, 1994 Draft Proposals" (SCAA 1994) encourages their use by stating:

"Pupils should be given opportunities to apply and develop their information technology (IT) capability in their study of art where appropriate."

Although Art is only a required subject until the end of Key Stage 3 it is a very popular option at GCSE level. It is at this stage that the I.T. National Curriculum draft document (SCAA 1994), has made allowances for pupils to develop their I.T capabilities in other areas of the curriculum "as an alternative to specialist IT courses."

The software that we used, open ended "paint programmes", allowed for fully creative responses which would not be as readily achieved with "Computer Aided Design" programmes better suited to technical and architectural drawing. "Deluxe Paint IIE" and "Drawmouse" seemed adequate for our purposes and we were still discovering their capabilities. However, as with all aspects of I.T. there is constant innovation and one would have to try to remain aware of developments.

Although other facilities of the software would be shown as appropriate, I would prefer not to insist that every pupil made use of them. Art courses should encourage individual creative responses and this should apply equally to tools and materials. Instead, pupils should be encouraged to develop the confidence to enlist the help of the computer when they perceive it to be the most appropriate tool. This is the approach advocated at Key Stage 4 by the National Curriculum draft proposals for I.T.

Not only do computers offer the advantage of carrying out a number of essential processes more quickly, they also give the possibilities of greater experimentation while retaining all stages of the designs development. It is also possible for pupils to work co-operatively and because of the immediate feedback provided by I.T. they can evaluate and improve work without feeling threatened by the fear of making irreparable changes. Computers can therefore encourage a more confident and resourceful approach to designing and investigating. They also free more time for other practical textile processes to be learned. Finally, an important aspect of using computers in developing designs, which is a point well made by Mathieson (1993) is that;

..."learning becomes understanding rather than a set of right answers and children who use computers in this way often approach problems in other areas with greater confidence."

APPENDIX 1

QUESTIONNAIRE AND RESPONSES ABOUT COMPUTER PROVISION IN WIRRAL ART DEPARTMENTS.

QUESTIONNAIRE

COMPUTERS IN ART DEPARTMENTS IN WIRRAL SCHOOLS.

1. Do you, or any of your department, use computers in the Art Department?

   (If the answer is NO please skip to Q11 and Q12)

2. With which year groups do you use computers in Art?

3. How many computers do you have in the Art Department?

4. Is this enough for your needs?

5. What sort of computer(s) do you have?

6. What sort of printer(s) do you have, if any?

7. What software packages do you use and with which groups?

8. For how long have you been using computers in Art?

9. Why did you introduce their use?

10. What disadvantages have you found?

11. Do you teach textiles in Art?
    Do you teach this to GCSE level?

12. Is the Art Department involved with delivering Technology AT5, perhaps by working with the IT Department?

SUMMARY OF COMPUTER FACILITIES AND TEXTILE AND AT5 INVOLVEMENT IN WIRRAL SECONDARY SCHOOL ART DEPARTMENTS.

WIRRAL SEC. SCHOOL	GROUPS TAUGHT LT.	NO. COMP. IN ART DEPT.	PRINTER FACILITY	WHEN COMPUTER ACQUIRED	ART TEXTILES TAUGHT	AT5 INVOLVE -MENT
A. BEB.HI	0	0	NO	0	YES	NO
B. B.I.	0	1 ELONEX	NO	1993	YES	NO
C. HILBR	9-13	1 ELONEX BBC NET	DESKJET 510	SEPT.93	NO	INFORMA LLY
D. MOSS	0	1 AMIGA	COLOUR	1993	NO	NO
E. OLDER	7 & 8 & 9	BBC NET PCs	B & W COLOUR	1989	YES TO GCSE	INFORMA LLY.
F. PARK	-	-	-	-	-	-
G. PEN. B.	-	-	-	-	-	-
H. PEN. G.	0	1 ARC.	NO	?	BATIK TO GCSE	NO
I. PRENT	-	-	-	-	-	-
J. RIDGE	0	0	NO	0	NO. TEX IN TECHNOL.	NO
K. ROC.F	0	2 ARC.	?	?	YES TO GCSE	NO
L. S.W.H.	10 & 11 TEX	1 NIMBUS	COLOUR	1991	YES TO GCSE	NO
M. WALL.	0	1 NIMBUS	?	1993	YES	NO
N. WEAT	-	-	-	-	-	-
O. W. K.	0	1 ARC.	COLOUR	1988	YES TO GCSE	NO
P. WIRR.	0	1 BBC	B&W	?	NO	NO
Q. WOOD	0	1 ELONEX	COLOUR	1991	YES	NO
R. ST. BE	0	BBC NET. 1 NIMBUS	COLOUR	?	NO	LAPSED
S. PLESS	0	0	0	0	0	0
T. ST. MA						

APPENDIX 2

SCREEN DUMPS FOR "DELUXE PAINT IIE"

APPENDIX 3

QUESTIONNAIRE TO WIRRAL ART TEACHERS AND THEIR RESPONSES

TABLE TO SHOW RESPONSES OF TEACHERS OF ART TEXTILES

QUESTION 1	YES	NO
Have you used a computer before?	1	1

QUESTION 2 Tick any of the following for which you have used a computer:	TICKS
Word processing	1
Spreadsheets	0
Data base	0
Signwriting	0
Graphics	1
"Painting"	1
CAD/CAM	0
Textile design	0
Games	0
Other	0

QUESTION 3	YES	NO
Are computers used as part of the Art course at your school?	1	1

QUESTION 4 What are the computers used for?	RESPONSES
CAD/CAM	0
Graphics	0
Textile design	0
Word processing	1
Other	Painting

QUESTION 5 Which pupils use computers in Art?	RESPONSES
Year 7	0
Year 8	0
Year 9	0
Year 10	1 - a few
Year 11	1 - a few
Year 12	1 - a few

QUESTION 6	YES	NO
Have you seen/used **Deluxe Paint** software?	0	2

QUESTION 7	YES	NO
Have you seen/used **Drawmouse** software?	0	2

QUESTION 8	RESPONSES
Have you seen/used other programmes to design for textiles?	1 - **Artisan**, only a little.

QUESTION 9	YES	NO
Do you think that there are any areas of Textile design where using a computer might be helpful to your pupils?	2	0

QUESTION 10 If yes, please tick any below for which your pupils might find a computer helpful, or write in any others.	TICKS
Drawing/painting	1
Colour	2
Texture	2
Shapes	2
Sizes	2
Repeats	2
Producing copies	2
Making colour separations	2
Saving designs for future use	2
Other	0

QUESTION 11	RESPONSES
If you would like to use computers more in the Art department what would most help you to do this?	One to one, on going evening sessions.
	Suitable programme for own computer and time to experiment.

QUESTION 12 What do you think are disadvantages to using a computer in textile design?	RESPONSES
The mouse feels so different from a pencil, pen or paint brush.	1
The colour printouts do not show the screen colours accurately.	0
The size of designis limited.	1
Other disadvantages are....	Only having one computer would restrict use to small groups of A' Level. Used as an aid to develop design, not as a substitute.

APPENDIX 4

QUESTIONNAIRE TO STUDENT TEACHERS AND THEIR RESPONSES

TABLE TO SHOW RESPONSES OF STUDENT TEACHERS AT A COLLEGE OF HIGHER EDUCATION.

QUESTION 1	MALE	FEMALE
Are you male or female?	1	19

QUESTION 2	NONE	SOME	LOTS
At the start of your degree course what was your experience of using computers?	8	11	1

QUESTION 3 Tick any of the following for which you had used the computer:	TICKS
Word processing	8
CAD	0
CAM	1
Graphics	6
Spreadsheets	3
Data base	6
Games	11
Other	0

QUESTION 4 If 'Other' was ticked please explain what this was.	RESPONSES
	Nil response

QUESTION 5	YES	NO
When you started this textile course did you expect to use the computer for designing?	10	10

QUESTION 6 Which of the following techniques from "Deluxe Paint 11Enhanced" have you used during your textile course so far?	TICKS
Tile	15
Mirror	11
Cyclic	5
Creating a 'brush'	18
Other	Spray Colour spectrum Magnify techniques

QUESTION 7	RESPONSES
If 'Other' please explain what this was	See above

QUESTION 8	YES	NO
Have you used a scanner to 'input' your designs?	5	14

QUESTION 9	YES	NO
If 'Yes', did you find this helpful?	4	1

QUESTION 10	YES	NO
Do you think using the computer helps you develop your designs for textiles?	17	1

QUESTION 11 If 'Yes' tick any of the following statements that you agree with:	TICKS
I can alter my shapes more easily	18
I can work more quickly	15
I can change the colour schemes quickly	17
I can experiment with repeat patterns more easily	17
I can preview what my design would look like	13
I can save each stage of the design separately so that I can go back to an earlier design	14
Please write in any other advantages ...	Better for perfection (detail)

QUESTION 12 What do you think are the disadvantages of designing textiles on the computer? Tick any you agree with:	TICKS
The stylus feels different from a pencil, crayon, paint brush etc.	3
The colour printouts do not show the screen colours accurately	5
The size of designs is limited	2
Other disadvantages are ...	Lack of technical knowledge. Expensive.

QUESTION 13	YES	NO
Have you used other programmes to design for textiles?	3 - Cameo x 2	17

QUESTION 14	RESPONSES
Please explain which programme you preferred and why	Deluxe Paint - used to it Deluxe Paint Deluxe Paint Deluxe Paint - tools more accessible.

QUESTION 15	YES	NO
Would you like to do more designing for textiles on the computer?	13	2

QUESTION 16	RESPONSES
If 'Yes', what would most help you to do this?	More time. Allocated time for computer. Availability of useful programmes. Computer availability & confidence to use them. Money. Practice.

QUESTION 17	YES	NO
When you start teaching, do you think that you would like your pupils to use computers sometimes as a design tool?	8	1

QUESTION 18 Please give reasons for your answers above.	RESPONSES
Positive:	Introduces children to more variety of computer techniques, gives confidence to children who aren't particularly confident in drawing. To widen their experiences in terms of manner of working, the media in use. Also to create opportunities for those children with SENs either gifted or with learning difficulties to develop their perceptions of colour discernment. Having the experience offered by computer design as expressed in the advantages listed in Q11. Advantages outweigh disadvantages.
Negative	I don't feel competent myself.

APPENDIX 5

EXAMPLES OF ONE PUPIL'S USE OF THE COMPUTER.

APPENDIX 6

RANDOM COLOUR PRINTOUTS

목차

APPENDIX 7

"LOAD OVER" WORKSHEETS

FILLING AN OUTLINE SHAPE WITH A REPEAT PATTERN

1 Switch on the computer and select "DRAWMOUSE".

2 Insert your own disc with your repeat pattern on it.

3 Go to "FILE" on the menu and then "SET PATH"- type in A: .Load your design to fill the screen.

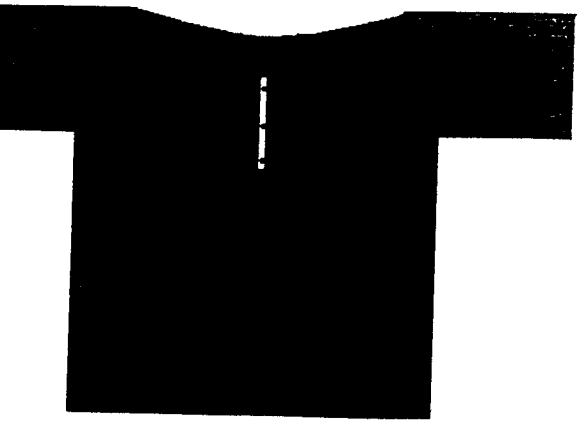
4 Remove your disc and insert the OUTLINES disc. Select "LOAD OVER" and type in the name of your chosen outline such as:
BED, SHIRT, WCOAT or DGAREE

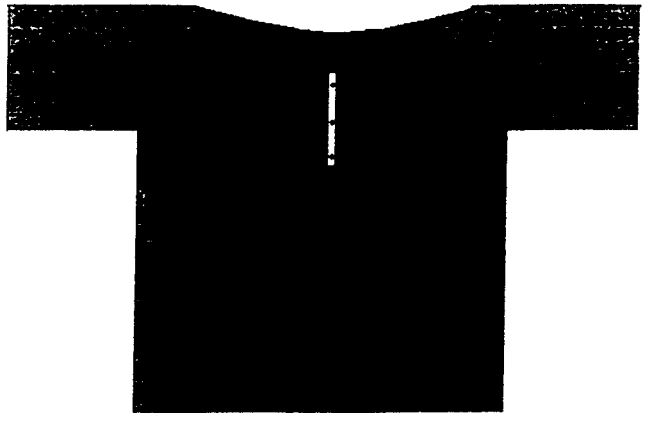
5 REMOVE THE OUTLINES DISC FROM THE COMPUTER!

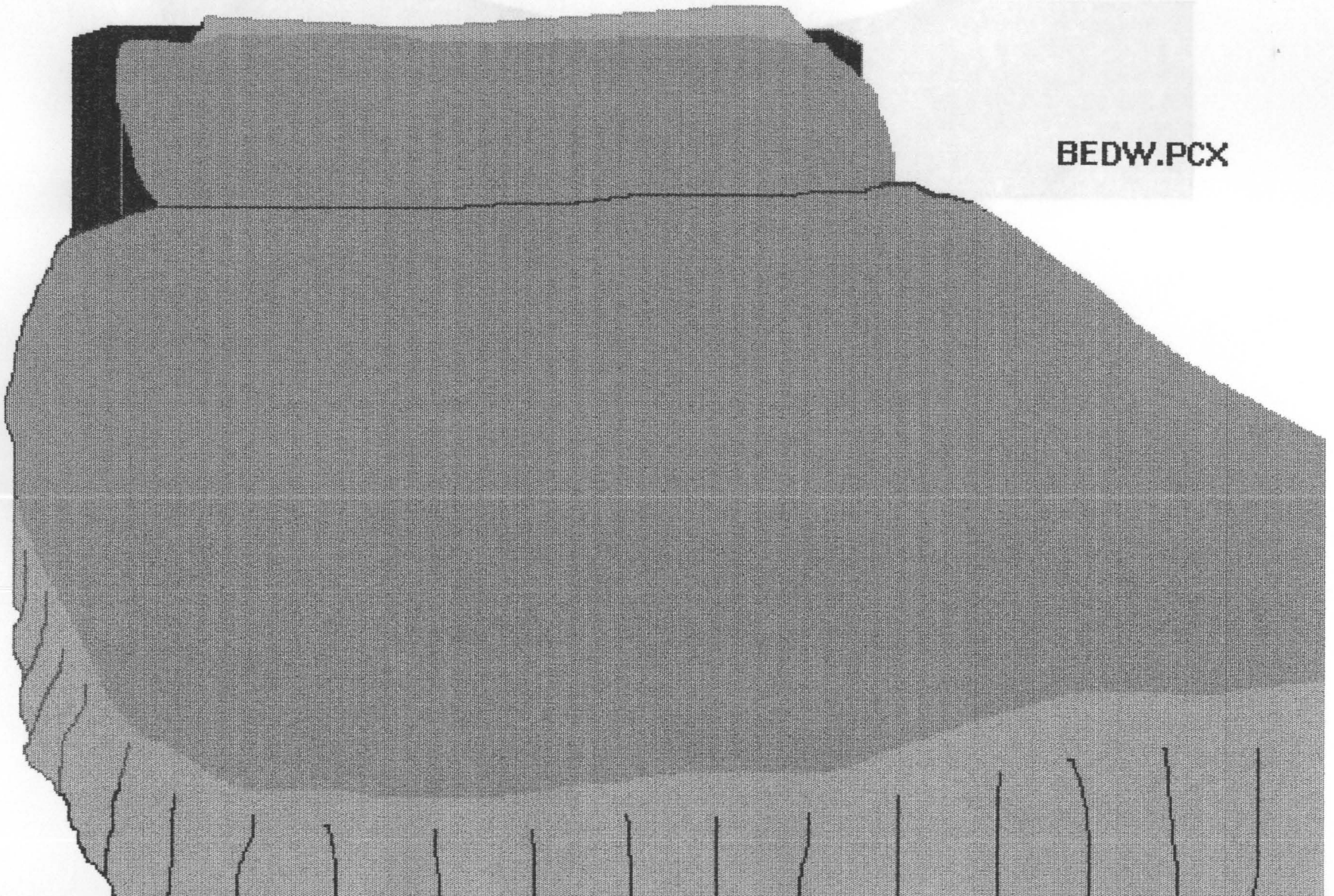
6 If you like your design filled outline then save on your own disc by inserting it and clicking on "SAVE PCX. Type in a name for this file but you don't have to add PCX as the computer will do this for you. Press "ENTER".

7 Print out your design.

8 Try your design in other outlines.
Try filling the outline chosen with other designs.



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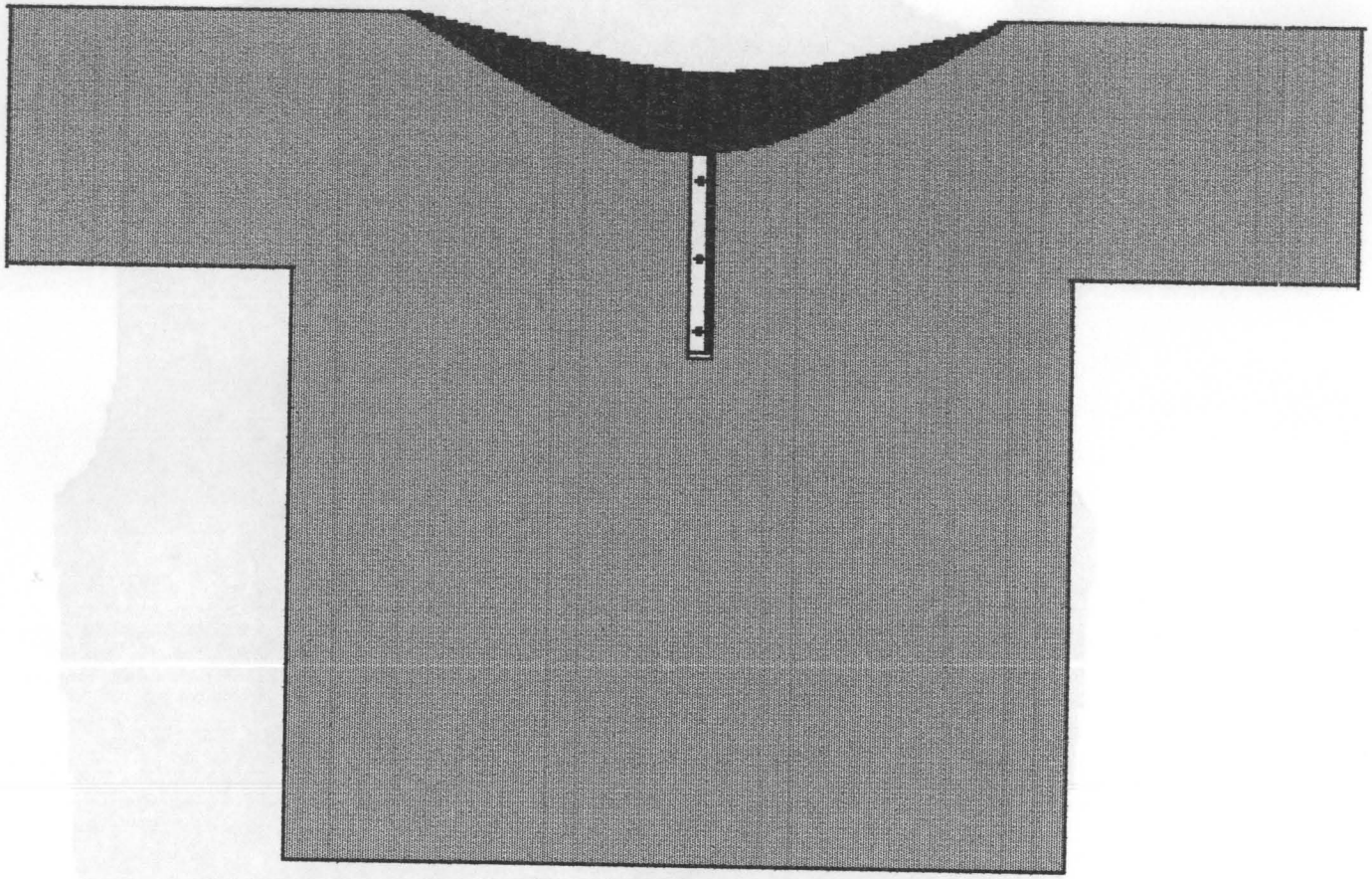
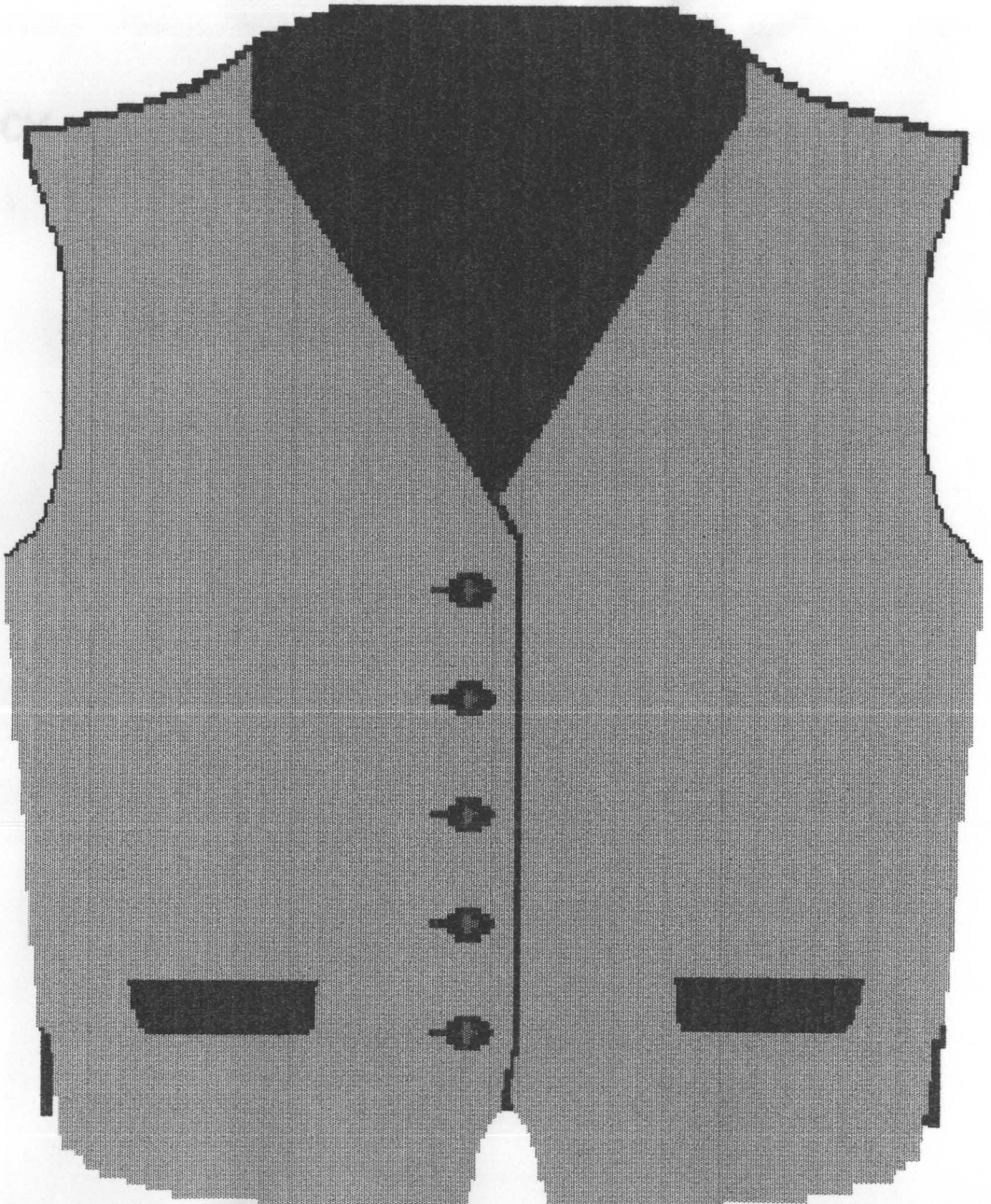
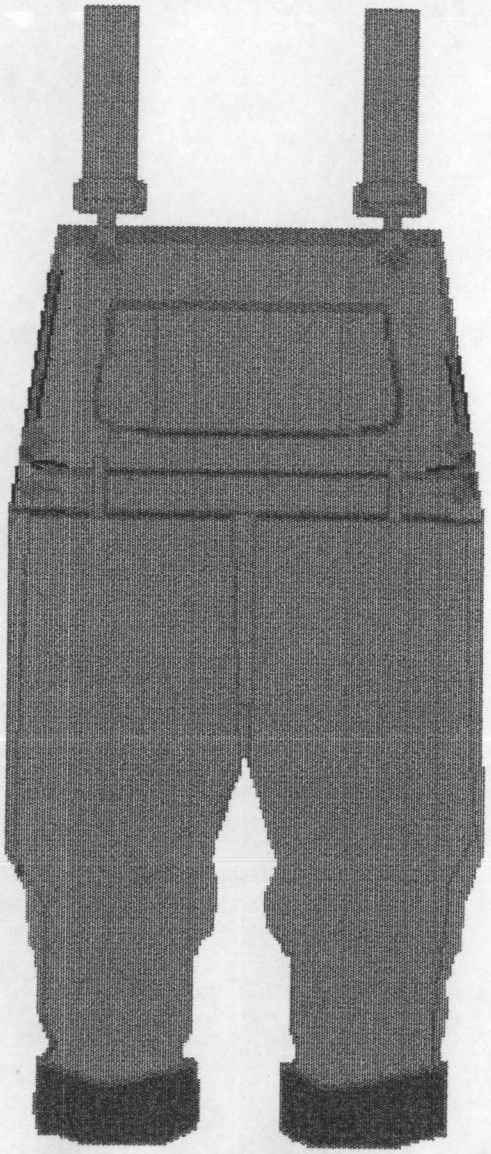


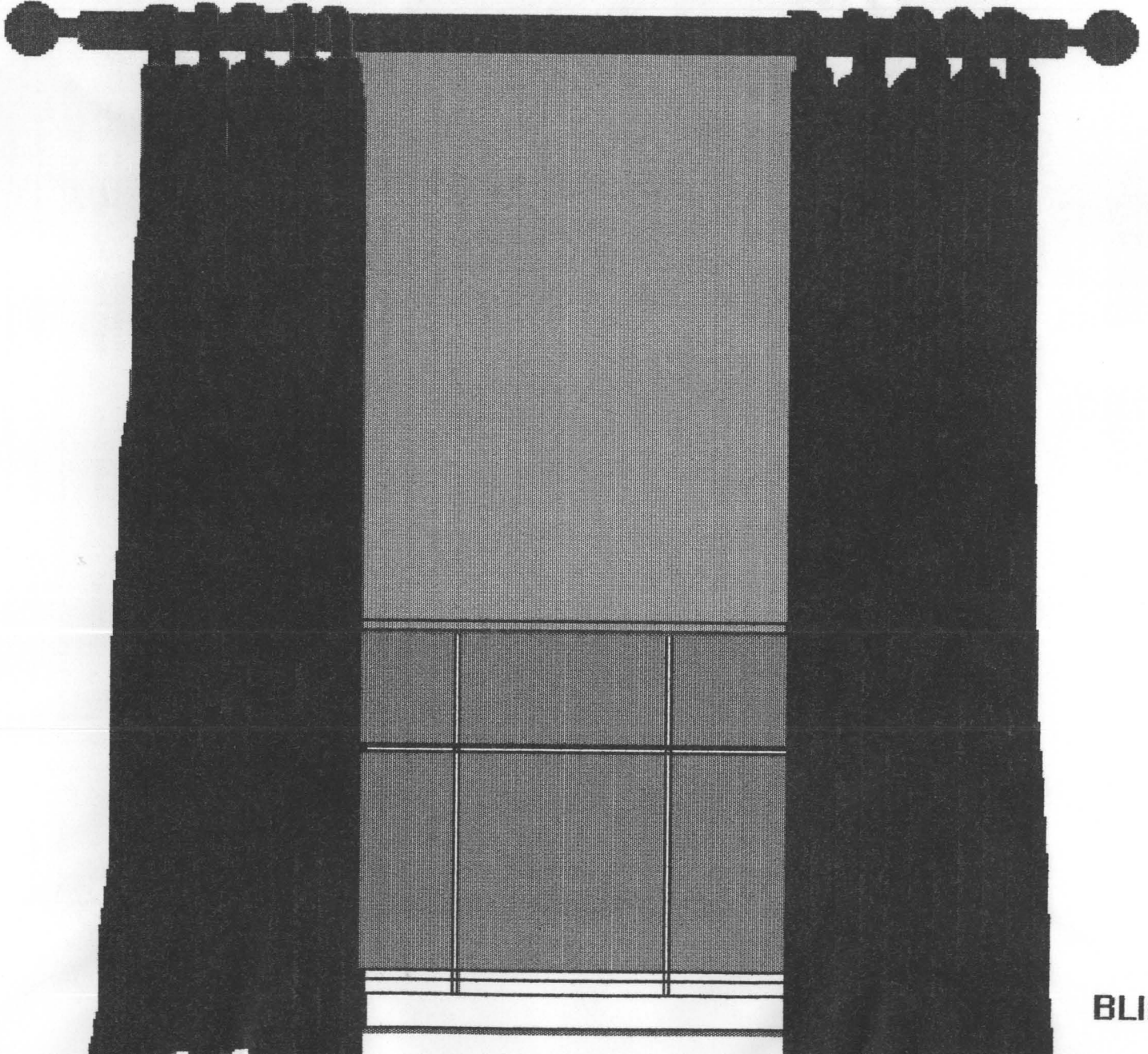
SHIRTW.PCX



WCOATW.PCX

DGAREE.PCX





BLINDW.PC

APPENDIX 8

QUESTIONNAIRES TO PUPILS IN PILOTS ATEX1 AND ATEX2 AND THEIR RESPONSES.

TABLE TO SHOW RESPONSES MADE BY AT1 IN SEPTEMBER 1992

QUESTION 1	BOY	GIRL
Are you a boy or a girl?	3	9

QUESTION 2	NONE	SOME	LOTS
In September 1991 what was your experience of using computers?	1	11	0

QUESTION 3 Tick any of the following which you had used the computer for:	TICKS
Word processing	6
Spreadsheets	0
Data base	1
Signwriting	2
Graphics	9
Wordsearch	1
CAD	0
CAM	0
Games	5
Other	1

QUESTION 4	OTHER
If other was ticked please explain what this was.	Arts & Letters

QUESTION 5	YES	NO
When you started your GCSE Textile course did you expect to use the computer for designing?	3	9

QUESTION 6 Which of the following techniques from "DPaint 11E" have you used during your textile course so far?	TICKS
Tile to create repeating block patterns	10
Mirror to make a whole page design	6
Cyclic to make a whole page design	1

QUESTION 7	YES	NO
Have you tried creating a "brush" by selecting aportion of your designs to repeat?	7	5

QUESTION 8 If "No" was this because:	RESPONSES
You didn't have time to try this	3
You didn't understand how to do this	1
You didn't want to do this	0

QUESTION 9 If you have tried creating a brush which of the following did you experiment with?	RESPONSES
Outline	3
Halve	2
Double	2
Stretch	2
Flip	2
Rotate	5
Bend	0
Shear	0

TABLE 8.1

QUESTION 10	YES	NO
Did you enjoy designing with your "brush"	9	3

QUESTION 11	YES	NO
Do you think using the computer helps you develop your designs for textiles?	7	3

QUESTION 12 If "YES" tick any of the following statements that you agree with.	TICKS/RESPONSES
I can alter my shapes more easily	4
I can work more quickly	4
I can change the colour schemes quickly	2
I can save each stage of the design separately so that I can go back to an earlier design	5
I can print out more than one copy	3
Other	Easy

QUESTION 13 What do you think are the disadvantages of designing textiles on the computer? Tick any of these you agree with:	TICKS/RESPONSES
The mouse feels so different from a pencil, pen or paint brush	3
The prints are only in black and white	8
The size of design is limited	2
Other disadvantages are...	"None"

QUESTION 14 Have you used other programmes to design for textiles? If "YES" give the names	YES	NO
	1 - "Arts & Letters"	10

QUESTION 15	YES	NO
Would you like to do more designing for textiles on the computer?	11	1

QUESTION 16	STATEMENT	RESPONDENTS
What would most help you do this?	To be able to use the computer	1
	More computers	5
	Colour printer	2

TABLE TO SHOW RESPONSES OF AT1 IN MAY 1993

QUESTION 1	BOY	GIRL
Are you a boy or a girl?	1 - 2 absent	9

QUESTION 2	NONE	SOME	LOTS
What is your experienceof using computers?	0	8	2

QUESTION 3	YES	NO
Do you have access to a computer at home? If YES please say what make.	Amstrad - 2 Packard Bell Amiga Commodor	4

QUESTION 4	TICKS
Word processing	5
Spreadsheets	2
Wordsearch	2
Signwriting	2
Graphics	7
CAD	2
CAM	0
Data base	0
Games	8
Other	0

QUESTION 5	RESPONSES
If "other" please explain what this was	Textile design

QUESTION 6	RESPONSES
If you have not used the computer in ART TEXTILES please say why not ... and then go to the end	0

QUESTION 7	LIKED	DISLIKED
Have you liked using the computer for designing?	9	1

QUESTION 8 How do you think the computer has been helpful in designing for ArtTextiles?	RESPONSES
	Quicker than drawing
	Quicker for designing
	Can change colours & designs easily
	" " " " " "
	Design sheets for use of colours
	Good for creating repeat patterns
	To make different examples for design sheets
	Computer is much quicker, can produce many designs quickly, gives precise lines & good graphics

TABLE 8.2

QUESTION 9 What do you think the disadvantages have been?	RESPONSES
	Printer slow
	Printer slow & only one computer
	" " " " " "
	Mouse hard to draw accurately with
	Difficult to draw with
	May lose designs
	When we didn't have a colour printer
	None

QUESTION 10 Please show which computer programmes you have used:	TICKS
Interword	1
Deluxe Paint 11E	8
Drawmouse	2
Others	0
Arts & Letters	3
Deluxe Paint 111	2

TABLE TO SHOW RESPONSES MADE BY AT2 IN SEPTEMBER 1992

QUESTION 1	BOY	GIRL
Are you a boy or a girl?	2	7 - one pupil absent.

QUESTION 2	NONE	SOME	LOTS
What is your experience of using computers?	0	9	0

QUESTION 3	YES	NO
Do you have access to a computer at home?	4 - 2 Amigas Amstrad C64 BBC	5

QUESTION 4 -Tick any of the following for which you have used the computer:	YES	NO
Word processing	3	6
Wordsearch	1	8
Spreadsheets	0	9
CAD	4	5
Data base	0	9
CAM	2	7
Signwriting	0	9
Games	0	9
Graphics	8	1
Other	0	9

QUESTION 5	OTHER
If 'Other' please explain what this was.	0

QUESTION 6	YES	NO
Do you expect to use the computer during your textile course?	6	3

QUESTION 7	STATEMENTS	RESPONDENTS
If 'Yes' what do you expect to do?	Signwriting	1
	Headings	1
	Drawings	1
	Design	1
	Design patterns	1
	Print out designs	1

QUESTION 8	YES	NO
Would you like to use the computer for designing?	9	0

TABLE 8.3

QUESTION 9	STATEMENT	RESPONDENTS
How do think the computer might be helpful in textile designing?	Give you more idea of what design you would like to make	3
	Repeating patterns	4
	Reprints	3
	Putting in colour in designs and choosing	1
	Helps to save work	1
	Faster	1
	The computer can help you draw and design	1

QUESTION 10	STATEMENT	RESPONDENTS
What do you think the disadvantages might be?	You may not be able to copy the pattern correctly.	1
	Faster	1
	Computer might help too much	1
	You might not have all the variety you could have.	1

QUESTION 11- Please name any computer programmes that you have used such as:	RESPONDENTS
Interword	1
Deluxe Paint II Enhanced	0
Deluxe Paint III	2
Deluxe Paint IV	1
Other	0

TABLE TO SHOW RESPONSES MADE BY AT2 IN JULY 1993

QUESTION 1	BOY	GIRL
Are you a boy or a girl?	2	6 - (2 absentees)

QUESTION 2	SOME	LOTS
What is your experience of using computers?	5	3

QUESTION 3	YES	NO
Do you have access to a computer at home?	5 -	3
	BBC, Amiga 500+,	
	Amiga 1200,	
	Sega Megadrive	

QUESTION 4 - Tick any of the following you have used the computer for.	YES
Word processing	3
Spreadsheets	2
Data base	1
Signwriting	3
Graphics	3
Designing	2
Wordsearch	1
CAD	0
CAM	0
Games	7
Other	2

QUESTION 5	OTHER
If 'other' was ticked please explain what this was.	Windows games
	Drawmouse

QUESTION 6	YES	NO
Have you liked using the computer for designing?	7	1

QUESTION 7 How do you think the computer has been helpful in designing for Art Textiles?	STATEMENT	RESPONDENTS
	Doing repeat patterns	2
	Getting pictures from "DPaint"	1
	You can save your drawing & print it out & it will always be the same.	1
	You can experiment differently & try different colours.	1
	Saves drawing & different colour schemes.	1
	It gives you a better idea of what the design is before you make it.	1

TABLE 8.4

QUESTION 8 What do you think the disadvantages have been?	STATEMENT	RESPONDENTS
	Not enough computers in the room.	1
	Not enough time.	2
	Hardly get to use the computer.	1
	The mouse didn't work right.	1
	The colours don't come out the same on the printer as they are on the computer.	1
	If you press the wrong key you could wipe the whole design.	1

QUESTION 9 Please underline the computer programmes you have used such as:	YES
Interword	3
Deluxe Paint II Enhanced	8
Drawmouse	8
Arts & Letters	4
Deluxe Paint III	2
Other	DPaint 4

QUESTION 10 Which programme(s) have you found most useful in Art Textiles and why	PROGRAMME PREFERRED	REASON
	DPaint IIE	Better graphics, easier to use.
	Drawmouse	For repeats
	Drawmouse	Because you can put your design on it & see what it is like.
	Drawmouse	-
	D.P. and Drawmouse	There are several things to experiment with.
	D.P. and Drawmouse	"
	Arts & Letters	For picture ideas.

TABLE TO SHOW RESPONSES MADE BY AT2 IN MAY 1994

QUESTION 1	BOY	GIRL
Are you a boy or a girl?	2	7 - 1 absentee

QUESTION 2	NONE	SOME	LOTS
In September 1992 what was your experience of using computers?	0	8	1

QUESTION 3 Tick any of the following that you had used the computer for:	TICKS
Word processing	7
Spreadsheets	2
Data base	1
Signwriting	6
Graphics	6
Wordsearch	0
CAD	0
CAM	0
Games	8
other	0

QUESTION 4 If 'other' was ticked please explain what this was. - Nil response applicable.

QUESTION 5	YES	NO
When you started your GCSE course did you expect to use the computer for designing?	2	7

QUESTION 6 Which of the following from "DPaint" have you used during your textile course?	TICKS
Tile to create repeating block patterns	9
Mirror to make a whole page design	1
Cyclic to make a whole page design	0

QUESTION 7	YES	NO
Have you tried creating a 'brush' by selecting a portion of one of your designs to repeat?	6	3

QUESTION 8 If 'No' was this because:	TICKS
You didn't have time to do this	3
You didn't understand how to do this	0
You didn't want to do this	0

QUESTION 9 If you have tried creating a brush which of the following did you experiment with?	TICKS
Outline	2
Halve	3
Double	2
Stretch	3
Flip	2
Rotate	3
Bend	2
Shear	0

TABLE 8.5

QUESTION 10 Tick any of the following "Drawmouse" features you used for designing	TICKS
Draw	3
Make repeats	6
Random colour change	3
Load over	0
Other	0

QUESTION 11	YES	NO
Have you used a scanner to 'input your designs?	7	2

QUESTION 12	YES	NO
Did you find this helpful?	7	1

QUESTION 13	YES	NO
Do you think using the computer helps you develop your designs for textiles?	7	2

QUESTION 14 If 'Yes' tick any of the following you agree with:	TICKS/RESPONSES
I can alter my shapes more easily	4
I can work more quickly	3
I can change the colour schemes quickly	6
I can experiment with repeat patterns more easily	5
I can see what my design would look like on a waistcoat etc.	5
I can save each stage of a design separately so that I can go back to an earlier design	4
I can print out more than one copy	5
Please write out any other advantages	I enjoy using computers

QUESTION 15 What do you think are the disadvantages of designing textiles on the computer? Tick any you agree with	TICKS/RESPONSES
The mouse feels so different from a pencil, pen or paint brush	5
The colour printouts do not show the screen colours accurately	6
The size of design is limited	5
Other disadvantages	Time consuming Confusing

QUESTION 16	YES	NO
Have you used other programmes to design for textiles?	0	8

QUESTION 17	YES	NO
Would you like to do more designing for textiles on the computer?	4	5

QUESTION 18	RESPONSES
What would most help you to do this?	More time
	More time and more computers.

APPENDIX 9

EXAMPLES OF PUPIL A'S DESIGNS FOR THE SCREEN PRINTING ASSIGNMENT DEVELOPED ON A COMPUTER.

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